SECTION C

EMPLOYER'S REQUIREMENTS

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SECTION C - PART 1

GENERAL SPECIFICATIONS

1.1 Brief Description Of Works

1. The General Services Department of ASHGHAL requires to employ a Contractor to supply and maintain, "Heavy Vehicles/Equipment" for the use of "Roads Operation and maintenance Department" of' Assets Affairs' of ASHGHAL for Duration of Five (5) years

2. All Heavy vehicles / Equipment are rented for dealing emergencies, operations and maintenance activities, therefore 24 hours commitment is needed.

3. Tenderer shall provide his offer with Driver/Operator. The tenderer need to submit the breakdown of Rates. The cost of providing vehicles and cost of Drivers/Operators need to be separately identified to the Engineer on demand.

4. All the responsibility of maintaining the heavy vehicles / equipment supplied under this contract falls on contractor. The contractor is required to maintain and undertake all the necessary periodic servicing of equipment. The contractor will need to ensure the supplies of all related and needed spare parts.

5. The contractor need to arrange and bear the cost of providing frequent inspections, insurances, the needed renewals, legalization of licenses / certificates and required consumables including fuel and water.

1.2 Overview Of Contract

1. General

The contractor shall work along with PWA in maintaining all assets throughout country, through making available the necessary heavy vehicles, machines and equipment on rental basis along with drivers, operators, supporting staff and labour workforce.

All the contractor's representatives including drivers, operators and workers (labourers) shall work hand in hand along with PWA personnel. They shall co-ordinate every day, every moment to resolve all the issues that arise in operation and maintenance activities.

The aim of this contract is to keep all the required heavy vehicles, machines and equipment ready all the time to engage in operation and maintenance activities.

2. Classification of Equipment

A common term 'Equipment' have been used within this document to describe heavy vehicles, machines, equipment, tools etc.

The equipment is broadly classified into the following categories.

- Regular Pooling Equipment
- Auxiliary Pooling Equipment
- Emergency Response Equipment
- Secondary Response Equipment
- Collision Investigation Equipment

The list of equipment identified by Engineer in each category is appended.

a. **Regular Pooling Equipment**
Regular pooling equipment is the equipment which the operations and maintenance department of Assets Affairs intends to use regularly or **daily**. The contractor is obligated to make available such equipment **at all times** during the contract period. If the contractor fails to make available such equipment. Engineer reserves the right to impose a penalty on the Contractor an amount mentioned in Appendix-A of the Form of Tender for every occurrence or repeated occurrence of such incident.

b. **Auxiliary Pooling Equipment**
The auxiliary pooling equipment list is the anticipated additional pooling equipment. The equipment may become necessary in future to perform operation and maintenance activities due to advancements and expansions occurring within PWA.

The contractor needs to procure and supply this equipment **On-Call** basis under this contract when it becomes necessary.

If the contractor fails to provide this equipment when it is requested by the Engineer, Engineer reserves the right to impose a penalty on the Contractor an amount as mentioned in Appendix-A of the Form of Tender for every occurrence or repeated occurrence of such incident.

c. Engineer's Emergency Response Equipment
The above stated 'Regular Pooling Equipment' and 'Auxiliary Pooling Equipment' shall be supplied by the tenderer on rental basis. PWA shall reimburse the rental amount as quoted in the bills of quantity.

Besides the above identified two categories of equipment, Engineer intends to procure emergency response equipment. This is engineer's equipment. A separate bill provided in the BOQ for this equipment.

The tenderer need to supply this equipment and maintain till the end of this contract. And at the end of contract period the equipment need to handover in good working order and good condition.

If the contractor fails to provide this equipment when it is requested by the Engineer, Engineer reserves the right to impose a penalty on the Contractor an amount mentioned in Appendix-A of the Form of Tender for every occurrence or repeated occurrence of such incident.

d. **Secondary Response Equipment**
Similar to 'Emergency Response Equipment', the engineer has identified 'Secondary Response Equipment' which may become necessary time to time in line with the developments and advancements occurring in PWA

PWA is also developing and implementing Road Incident Management Policies and Procedures. In this context PWA needs to procure the secondary response equipment for implementing such policies and procedures. The contractor shall be given opportunity to procure and supply secondary response equipment when it is needed.

A provisional sum is allocated for this equipment, which will be spent in co-ordination with the contractor.

e. **Collision Investigation Equipment**
During the life of this contract, the engineer adopting latest techniques and methods to monitor the accidents and collisions on the roads networks. Latest investigating tools and equipment shall be used in near future. The contractor shall be given opportunity to supply latest collision investigation equipment according to the requirement prevails with in PWA.

A provisional sum is allocated for this equipment, which will be spent in co-ordination with the contractor.

The list of equipment and the specification shall be issued to the contractor when these requirements become apparent within department. However, PWA reserves the right to not to procure any such tools or equipment or any item through this contract.

1.3 Scope Of Work

The general activities to be undertaken are described below. The list is not exhaustive, the heavy vehicles / equipment may be engaged in the following activities including but not limited to

- Emergency Response to Incidents
- Safety and Emergency Repairs
- Roadway Inspection and Maintenance works
- Bridge Inspection Works
- Street Lighting Inspection & Repair
- Pothole Repairs
- Traffic Assistance for Lane Closures
- Medium / Heavy Lifting Services
- Clearing Operations after Incident/Accident

Roads Operation and Maintenance Department (Roads O&M Dept.) of Assets Affairs (AA) of ASHGHAL is responsible to operate and maintain Roads (more than 24 m width) in the State of Qatar.

Should the responsibility of department extend beyond above identified activities and scope the contractor should adopt the scope in fulfilling such responsibility.

1.4 Duration and location:

- The total duration of contract shall be for a period of 5 years. The contract shall price the rates for items as structured in Bills of Quantities in Section G.

Through this contract PWA seeks commitment from the contractor for the five years duration. The equipment and machines required to be **supplied on rental basis** under regular pooling and auxiliary pooling are identified. The tenderer need to price the items accordingly. During the period of this contract no amendments to the rates shall be entertained.

- The vehicles are expected to work mainly within the Greater Doha area and from time to time in other part of the country. While the central mobilization point would be Assets Affairs Building in Doha, located on Salwa road near to fish market.

- Contractor is allowed to mobilize within 3 months of awarding time.

1.5 Compliance to standards and laws

The contractor should keep the following documents all the time ready for reference, and should comply with them all the time during this contract.

- General conditions and standards of PWA Operations and Maintenance department.
- General conditions and standards of Police and Other law enforcement agencies. Any and all applicable local Municipality regulations.
- The General Conditions of Contract – May 2007 prepared by the Contracts & Engineering Business Affairs (CEBA), Public Works Authority.
- Qatar National Construction Specifications (QCS2014) the 4th Edition prepared by the Qatar General Organization for Standards and Metrology (QGOSM) issued with Standard No. QS27/2014 dated October 2014 and all subsequent revisions and amendments.
- The Code of Practice and Specification for Road Openings in Highways prepared by the Public Works Authority, January 1992. (Amendment January 2011).
- The Guide for Civil Users of Explosives in Qatar prepared by the Ministry of Public Works.
- The Qatar Survey Manuals prepared by the Urban Planning and Development Authority (UPDA).
- The Qatar Traffic Manual (QTM) and Qatar Highway Design Manual (QHDM) prepared by the Ministry of Public Works.
- Drainage Affairs, Standard Supplementary Specification to Qatar Construction Specification.
- State of Qatar Law No. (6) of the year 1987 and all subsequent amendments concerning Materials and Equipment from Qatar or other CCASG countries, obtainable from Ministry of Justice, Doha
- Safety Rules issued by the Department of Electricity Networks. The Joint

Manual prepared by Electricity Networks Department.

- State of Qatar Law No. 32 of 2005 and all subsequent amendments concerning Traffic in the State of Qatar obtainable from Ministry of Justice, Doha.

- Any Amiri Decree or current and relevant regulation, notice or circular issued by the Ministry of Municipal Affairs and Agriculture (including the previous Ministry of Public Works and the previous Ministry of Industry and Public Works), the Ministry of Electricity and Water and/or the appropriate local Municipality prior to the date of the newspaper advertisement of this Tender.

- Work Zone Traffic Management Guide and Qatar Traffic Signs Manual – Volume 1 & 2

1.6 Strategic Plans and Schedules

Contractor should prepare and maintain the following strategic plans and schedules. On demand by the engineer, contractor needs to submit a copy for review.

After review if contractor receives any comments or suggestions from the engineer regarding these documents, contractor shall consider and revise the documents accordingly to satisfy the engineer's needs.

- Health, Safety and Welfare plan
- Quality Assurance Plan
- Environment Management Plan
- Sustainability Plan
- Stake holders Management Plan
- Parking, Storage and Logistic Plan
- Traffic Management Plan
- Contractor's superintendence and Organisation Chart
- Schedule of Sub Contractors and Suppliers
- Schedule of Machines / Equipment and Plant engaged in this contract
- Schedule of Proposed Machines / Equipment and Plant the contractor has the ability to supply for the future needs of PWA

1.7 Specific Relevant Codes

All the "crane type vehicles" shall be tested for Safe Working load (SWL) frequently to confirm they comply with the following Codes of Practice requirements and the test result must be certified by an approved TPA with ASHGHAL:

A	Mobile and Tower Cranes	:	BS: 1757, BS: 2799, and CP: 3010
B	Slings	:	BS:1290 / 6210, BS EN: 1492 / ISO: 4309, 3481 Part 2 / ASME: B30.9
C	Chain Blocks	:	BS: 3243

D	Shackles ; Alloy	:	BS: 3551 / 3032 / 6994
E	Chain	:	BS 4942 Part 1 & 6 / ISO: 2903, 7592
F	Hooks	:	BS: 2903, ASME B30.10
G	Ring and Link	:	BS: 2902

1.8 Co-Ordination And Communication

Contractor shall assign a full time representatives to work under 'Contractor's Support Team' at Salwa road - Assets Affairs Building for coordinating and facilitating with the engineer. This representative's office furniture and requirements (like, telephone, computer, fax, printer, etc.) is arranged by contractor and only location will be provided by ASHGHAL.

- This contract will be coordinated by a Project Coordinator (PC) assigned from 'Roads Operations and Maintenance Department (ROMD) of ASHGHAL.

- End user of service of this contract would be Roads Operation and Maintenance Department (Roads O&M Dept.) of Assets Affairs of ASHGHAL or any other department should the necessity arise.

- The department will introduce "user coordinator" who will be called here, and onwards, "Engineer" in this scope of work. He would be responsible for raising and/or releasing all needed services for the Department.

- PC is responsible to take necessary actions whether contractually and/or financially based on advices of the Engineers, to fulfil the requirements of this scope of work.

- All the vehicles, equipment are subject to inspection by ASHGHAL's Engineer and PC prior to acquiring permit to work; this task will be repeated at least once a year.

- Any rejected vehicle during inspection to be replaced within a reasonable time period agreed by Engineer, PC and the contractor.

All vehicles are subjected to annual inspection called "maintaining operational functionality of Equipment' under this contract, which would be conducted by Engineer/PC within 3 weeks prior to the start of each financial year
(The financial year starts on first of April of English Calendar).

The inspections would be holistic and comprehensive includes but not limited to the following.

- Overall inspection of functionality of the vehicles.
- Functional tests relates to operation of each vehicle.
- Verification of Submittals, Legalization Certifications of vehicles.
- Verification of TPA inspections and submittals of its related certification.
- Presence, appearance and condition of ASHGHAL's logo
- Tyres condition and compliance to requirements.
- Availability of Operational Facilities in good condition (Like: hoses, nozzles, Tackles)
- Availability of Spare Operational Facilities (Like: hoses, nozzles)
- Log books, operational records, overall condition and appearance of the vehicles.
- Evaluation of the "contractor's representatives performance report"
- The office facilities and arrangements for the contractor's employees.
- Maintenance Records.

1.9 Obligations and Commitments:

- This scope of work is designed to hire heavy vehicles / equipment along with drivers, operators, supporting staff, labour workforce within the contract period on 24hrs basis.

- All supplied vehicles to ASHGHAL must hold ASHGHAL's logo. The logo to be provided affixed to the doors side as per GSD standards by contractor.

- While contract is for renting all the vehicles and equipment for duration of the contract, but during the first year of contract, the Engineer has right to call each single vehicle "to service" or "releasing from service" by issuing a site instruction in a prescribed format. Payment would be based on availability of vehicles / equipment in service.

- The hire rate is to be all-inclusive comprehensively (i.e. insurances, servicing, documentation, repairs, spare parts, salaries, meals, fuel, water, refreshments and everything.)

- The Vehicles and Equipment has to be made available and served at PWA with total commitment for 24hrs each day

- Drivers / Operators have to serve 8 hours per shift. The job may be "rolled over" to 2 or more shifts. The contractor has to arrange a replacement driver to complete the job. Any driver, operator, supporting staff or labourer shall not work beyond 12 hours per day.

- The performance of Drivers/Operators is measurable in term of providing service should the Engineer requests at any stage during this contract.

- Contractor is responsible for all the matters relating to contractor's staff including but limited to personal care, legal issues, insurances, licences, documentation, orientation, training, PPE, wages, meals, refreshments, welfare, vacation, accommodation, health and safety etc.

- Disposal of water, debris and other refuse will be done to the sites advised by the Engineer or his representatives.

- All required PPE and other safety equipment must be provided by contractor to cope with the working conditions on live roads, highways and the dangerous zones.

- Vehicles may work in varying atmospheric conditions; at different locations of country passing by rough grounds etc. therefore the provided vehicle should be efficient and suitable to be operated in such conditions and deliver the required services. This clause is applicable to operators and drivers engaged. The contractor need to make sure, the operators and drivers possess all the required skills and abilities.

- The operators / drivers for the supplied equipment as per the Scope of Services must have adequate experience in operating the equipment and should have undergone all the required necessary training to carry out the services.

- Contractor's operators / drivers shall have completed all relevant safety trainings required to work in roads Operation and maintenance works and should possess proficiency and knowledge to carry out activities according to 'Work Zone Traffic Management Guide'.

- All operators / drivers shall have gained experience in roads Operation & Maintenance works and associated environment.

- Contractor shall fill in daily time sheets and obtain endorsement from concerned 'Ashghal's Representative in charge' at the end of every shift.

- Vehicles must be provided with full insurance to cover any repair and rectification of any damages, due to accident, and/or incident and/or malfunctioning of the Driver/Operator's performance.

- If a vehicle breaks down while dealing with an accident case on road or highway, the contractor need to replace the vehicle with proper one immediately within reasonable time agreed by Engineer.

- Contractor must follow all required local municipalities and local authorities' requirements.

- Contractor shall submit monthly report regarding status, services, locations of the vehicles to PC and Engineer.

- Contractor's operator / driver shall not work more than 12 hours per day as a routine, on some occasions in case of emergency the engineer may permit work beyond 12 hours. The employees should not exceed the working hours permitted by Qatari law.

- All lifting equipment, operators and drivers shall comply with Qatari Government Regulations and shall be operated with the relevant safety standards. Operators should have valid heavy equipment Qatari license (Eg. Cranes)

- The list and specification of the vehicles are mentioned in the third part of this specifications document, which Tenderer must read and indicate his compliance. For the Technical submission the tenderer need to indicate whether each requirement being complied or not, by marking against each item as "Y = YES" Or "N = NO". If any alternative specification offered that need to be indicated in the Offer column.

- Technical submittal by contractor shall clearly specify any alternative options of each requirement, by clearly addressing it. The specification of an alternative proposal should be equivalent or superior standard.

1.10 Licenses and certifications:

- The contractor shall be responsible for determining- proving-maintaining all required licenses for Drivers/Operators, in category 3 comply with QATAR Traffic Police regulations.

- The contractor shall be responsible to renew all the required registrations if any, obtain Police clearances, arrange technical inspections wherever necessary. For undertaking such activities if the vehicle / equipment removed, the contractor need to arrange replacement complying with all requirements.

- The contractor shall be responsible for maintaining, updating and proving with evidences and supporting documents in accordance with the manufacturer's recommendations.

- Any manufacturer recommendations regarding the licenses/certifications for Drivers / Operators working with high pressure devices must be obtained, maintained and renewed by the contractor.

- The contractor shall be responsible for determining that all vehicles / equipment comply with QATAR Traffic Police regulations regarding weight and axle loadings.

- The crane operators / riggers to be qualified as per National Commission for Certification of Crane Operators (NCCCO) or OSHA or ANSI requirements or equivalent (Tenderer shall specify and submit the equivalent with his offer)

1.11 Third Party Agency (TPA)

TPA must be chosen within one of the approved list of O&M Department of PWA.
TPA is an approved company or organization responsible on behalf of the Engineer for inspection /service/release.
The Contractor shall Hire approved TPA for testing of Lifting Equipment and other equipment to fulfil the obligations.
In all other mandatory required services of TPA, as mentioned in this scope of work the hired TPA shall be paid by Contractor.

1.12 Engineer's Items

The heavy vehicles / equipment supplied on rental basis need to be demobilised at the end of contract.

Most of the equipment classified under the following categories, are the engineer's items.

- Emergency Response Equipment
- Secondary Response Equipment
- Collision Investigation Equipment

PWA decided to procure engineer's 'Emergency Response Equipment' through this contract. Therefore, a separate bill is provided for the tenderer to quote.

PWA also has the intention to procure some of the 'Secondary Response Equipment' and 'Collision Investigation Equipment' through this contract if the requirement prevails during this contract period. The exact requirements are not known yet, hence provisional sums provided in the contract for these items.

Should the requirement prevail at any time during the contract period for the

above said items, the contractor needs to propose the specifications, make and brand through consultations with the project co-ordinator. The quotations, terms and conditions proposed and accepted by the end users should be formally forwarded to the authority through the regulated channel and procedures. The submitted quotations and proposals need to go through the qualifying procedures of the authority. Once the proposals accepted and agreed formally, a PO will be issued to the contractor to proceed with the purchase of equipment.

All those engineer's items supplied through this contract need to be maintained until the end of contract period. At the end of contract period the equipment need to be handed over in good order and condition. Prior to handing over the equipment which needs to be checked and certified by TPA that the equipment is in good order. If any servicing or repairs necessary prior to transfer, it should be completed.

All the routine checks, servicing, renewal of insurances, updating of documentation should be complete and in order at the time of transfer. The insurances, collateral warranties etc. needs to be transferred on to PWA name.

A provisional sum also provided for the maintenance of Ashghal's owned existing equipment, which is used by the Emergency Response Team. The contractor needs to service and maintain all such equipment. The invoices relates these maintenance service and maintenance task shall be reimbursed from this provisional sum.

1.13 Contractor's Support Team

The contractor needs to allocate a dedicated support team for smooth implementation of activities. The employees under this team should serve full time and should be stationed at Ashghal's premises to assist PWA engineers.

The following personnel should be available round the clock at Ashghal's premises to receive instructions and to act upon it.

a) Project supervisor / Co-ordinator : 1

b) Mechanic / Technician : 1

c) Office clerk / Personal assistant : 1

d) Equipment washers / Care takers : 2

The above personnel need to be made available with 24 hours commitment, therefore contractor need to have replacement personnel to cover above positions for all three shifts during a typical day and also to cover the absences due to sick leave, annual leave or any kind of other absence.

If the contractor fails to comply the above requirement, appropriate penalty applies.

Any of the above support team personnel found absent or removed without approval shall be proclaimed as non-compliance.

SECTION C - PART 2
PERFORMANCE SPECIFICATIONS

2.1 Introduction

PWA is dealing with general public while performing activities and fulfilling its obligations towards community. The contractor's staff shall be working along with PWA employees on day to day basis. The contractor's employees and operatives shall be representing Public Works Authority indirectly. The contractor needs to arrange orientation and induction for all their employees before engaging them onto the works under this contract.

All the contractor's employees should possess required code of ethics and manners. The contractor needs to ensure this. The employees and operatives should abide by all the applicable rules and regulations in place, and should comply with all government policies and procedures.

The contractor should have proper complaints handling procedures. Any complaint received against employees should go through this procedure.

2.2 Pre-requisites of work force:

The operators / drivers should meet the required qualification criteria as specified below in Table 1:

Table 1 (Operator's / Driver's Experience Requirements)

Headcount	Responsibility	Experience & Skills Requirement
1. Operator / Drivers	To serve as equipment operator / vehicle driver for Emergency Response Team (ERT)	Must have heavy equipment operations license, certified professional driver. Knowledgeable, proficient and capable to handle traffic management during course of emergency repairs. Must have the necessary training and license to drive and operate the appropriate vehicle/equipment Well versed with 'Work Zone Traffic Management Guide (WZTMG), 'Traffic Diversion Plans (TDP), Traffic Diversion Techniques etc.

- Contractor shall conduct a pre-assessment of work personnel practically at their work place before mobilizing them. This is to ensure right calibre of operators / drivers are engaged for the tasks.

- Contractor shall supply all necessary tool kits along with the technicians as part of the scope of services to Ashghal throughout the duration of the contract. Contractor shall include price in their quote for hiring of additional equipment, tools, whatsoever if it is necessary as per the job requirements.

- Contractor need to ensure the Drivers/Operators possess good manners to represent governmental organization, who deal with public complaints and public services. Failure to do so the person will receive disciplinary action (as per QATAR Regulations). If any situation leads to disciplinary action the contract may be terminated if any gross misconduct discovered and proved.

- Any required night shutdown activities are planned in advance, therefore on time attendance to the shutdown schedule is a must.

- Contractor is responsible for repair and rectification of all damages caused by accidents or incidents due to incompetency of the Drivers/Operators. All damaged tools shall be replaced immediately without affecting the job. Contractor shall not claim for any damage of the equipment /vehicle.

2.3 Orientation and Training:

- Competent engineer should be available at the time of delivery of equipment for training, about how to use, operate, maintain and to explain and deliver technical aspects of the vehicles, advices, recommendations, special techniques, etc.

- Operators, foremen, technicians etc. shall have full time training and facilities to learn about operation and maintenance of the units in their premises.

- Technical engineer should be available (3) three times in first year to refresh and enhance the operating knowledge, and maintain good performance of operators and aid to solve technical and operating problems in operating field. After that once a year. Otherwise depend on new vehicle replacement.

- Tenderer also need to submit CDs containing the information about each Vehicle/ Equipment demonstrating the information, how it can be operated and how it works etc

- All staff working on this contract should have undergone the required training to handle traffic management up to the satisfaction of authorities. They should be familiar and proficient with Work Zone Traffic Management Guide, Traffic Diversion Plans etc.

2.4. Code of Conduct

The contractor's employees engaged under this contract to provide services under this contract shall be working along with the PWA staff. Therefore the contractor's staff shall be indirectly representing PWA. Hence, they should have good code of conduct.

Contractor need to prepare complaints handling procedure and it should be approved by the PWA. The said procedure need to be disseminated among the employees. If any complaint received against any employee disciplinary action need to be taken immediately as per the complaints handling procedure.

If any complaint received against any of contractor's employee with regards to bad behaviour or misconduct, the invoiced amount for that day shall be withheld until the disciplinary procedure completed against the employee, and the complaint is resolved according to the approved complaints handling procedure as mentioned above.

2.5 Meetings

1 Kick off meetings

A Kick-Off meeting is required at starting up the job which shall be held at O&M Department. The PC shall set the date and time of the meeting and shall notify the Engineer and Contractor accordingly.

Kick-Off meetings shall be attended by the PC, Engineer and his representatives and the Contractor and his representatives.

The agenda for the meeting shall be provided by the PC/Engineer a minimum of three (3) working days prior to the meeting.

Topics for Discussion

Topics for discussion will include but not necessarily be limited to the following:

(a) Mobilization / Coordination from all parties
(b) Health and Safety
(c) Permits and Security procedures / traffic related Documents
(d) Working hours (Fridays/holidays/overtime working)
(e) Line of communication
(f) Start-up plan and schedule
(g) Notice Call formatting or Memo.
(h) Third party agency (TPA) for crane certification
(i) Log book for lease control.
(j) Reporting
(k) Contractor' s site facilities
(l) Inspection of Vehicles / Submittals
(m) Organization Chart/Staffing.
(n) Any other business.

2 Progress Meetings

Progress meetings shall be held upon Engineers or PC requisitions, the time and

location of the progress meetings shall be as directed by the Engineers / PC. The Engineer shall chair the meetings.

The Engineer shall prepare the agenda and submit it to the Contractor a minimum of three (3) working days prior to the meeting.

The Engineer will record minutes of each meeting.

A copy of the minutes shall be furnished to the Contractor within four (4) working days.

If the Contractor has any objections to the minutes he shall submit them in writing to the Engineer not more than two (2) days after they are presented to him. In the absence of any Objection, it shall be understood and agreed that the Contractor accepts the minutes as true and complete record of the meeting.

3 **Supply Chain Management Meetings**

The supply chain management team within PWA shall organise conferences, workshops and meetings to discuss the issues. Contractor's representatives shall take part in all such activities.

PWA has been putting efforts to implement KPIs in all sectors to improve performance. During this contract period, supply chain management team shall co-ordinate with the contractor's team in designing and implementing the KPIs. This is to ensure the contractor's management, staff and the organisation as a whole contribute and continue to improve to meet the standards and requirements in line with the global trends and norms

Contractor's representatives shall share all the responsibility and efforts in this regard.

4 **Health and Safety Meetings**

Contractor need to organise Health and Safety meetings regularly to discuss health and safety issues. All the representatives involved within this contractor should be aware of these meetings. These meetings need to be organised regularly. The requirements of health and safety training to the new members of the team need to discuss and the necessary training need to arrange for the new members.

2.6 Programmes And Reports

Inspection Schedule

The Contractor shall prepare and submit a list of Vehicles to be inspected along with the other necessary documents required by the Contract, within five (5) days from the start of the Contract.

The Contractor shall allow not less than fourteen (14) days for the review of submittals by the Engineer (excluding the time necessary for delivery or postal) and shall cause no delay in the work.

This above mentioned practice to be repeated on annual inspection as well.

Mobilization Programme

The Contractor shall prepare and submit to the Engineer a Mobilization Programme of all vehicles / equipment in accordance with this specification and the General Conditions of Contract.

The contractor also produce a detailed programme showing the comprehensive details of servicing schedule of equipment, renewal of insurances and other documents etc.

The Contractor shall update and revise the 'Programme of Equipment' as with the consultation of Engineer whenever it is required during the contract.

Reports

Daily, Weekly and Monthly status reports describing the details of Heavy Vehicles / Equipment used need to submit for the records of Engineer.

Contractor has to liaise with the Operation & Maintenance Department on a daily basis. The contractor need to submit interim reports when requested for the purpose of discussions, planning and management activities within PWA

Contractor is also responsible to submit a clear conditional report supported with clear photos (high resolution) describing the condition of vehicles / equipment, conditions of stores, condition of work place etc. when needed.

2.7 Up keeping and Maintenance:

- Contractor is responsible to carry all required regular and irregular Services / Maintenance for the vehicles / equipment. This includes arrangement of required spare parts as well, to ensure proper functioning of the vehicles / equipment.

- Tyres to be replaced from time to time by contractor at his own cost. Washing and cleaning of vehicles to be carried out by contractor frequently to ensure they are of good appearance.

- Down time maintenance period for regular maintenance is maximum one week, for which there is no payment for period of absence and also there is no penalty.

- In case of absence of vehicle more than one week if an alternative vehicle not supplied, then not only there would be no payment but also contractor will be penalized.

- If an equipment/vehicle breaks down and it need to be demobilised temporarily for repairing purpose, the duration to be discussed and agreed with the Engineer. The contractor need to prove that cause for break-down is not contractor's negligence. The contractor shall not be penalised in such circumstances.

2.8 Spare Parts for Equipment:

Contractor must provide equipment with a full set of operation facilities for the full and un interrupted functioning of equipment. The spares such as pressure hoses, suction hoses, nozzles etc. plus one complete set as spare need to be made available all the time.
Contractor must replace and provide a new set of spare as original and brand new for any of the above mentioned operational facilities due to damages within the work and / or end of their shelf life. This replacement shall be confirmed to Engineer.

2.9 **Samples And Certificates**

Samples

Samples are physical examples illustrating materials, equipment, or workmanship and shall be used to establish standards by which the work will be judged.
Each submittal regarding spare part or materials shall include two sets of samples. One set of approved samples and all disapproved samples will be returned to the Contractor.
Samples shall be labelled and properly identified with the following information:
(a) Date
(b) Part(s) of the Works for which offered
(c) Specification Section, Part and applicable Paragraph numbers
(d) Supplier/manufacturer
(e) Product identification (trade name).

Certificates

Where stated in the Contract Documentation or requested by the Engineer in writing, the Contractor shall submit manufacturer's certificates indicating that test results, component manufactured and/or installation complies with the requirements of the Contract Documentation.
A statement from the Contractor, Equipment supplier, or agent indicating the product installation complies with the requirements of the Contract Documentation shall not be considered as a certificate.

2.10 Guarantees And Warranties

Manufacturer's Guarantees and Warrantees shall be submitted prior to handover and final acceptance for the provided spares.

SECTION C - PART 3
EQUIPMENT SPECIFICATIONS

3.1 Introduction

A common term **'Equipment'** have been used within this document to describe heavy vehicles, machines, equipment, tools etc.

As stated in the general specifications of this document the equipment broadly classified into five categories according to requirements and utilization within Public Works Authority.

The equipment broadly classified as below.

- Regular Pooling Equipment
- Auxiliary Pooling Equipment
- Emergency Response Equipment
- Secondary Response Equipment
- Collision Investigation Equipment

The specifications for 'regular pooling equipment', 'auxiliary pooling equipment' and 'engineer's emergency response equipment' have been finalised. For other two categories the specifications shall be finalised and discussed with the contractor at the time of procurement. During the contract period once the requirement of equipment under the other categories becomes essential for PWA. Accordingly the specifications shall be finalised, the contractor shall be given opportunity to submit his quotation. If the quotation goes through the qualifying procedures and becomes successful, then contractor can negotiate the terms and conditions to supply the equipment under this contract.

The Bill No. 4 is for Emergency Response Equipment which is finalised. The engineer wishes to purchase the emergency response equipment through this contract. For Secondary Response Equipment and Collision Investigation Equipment a provisional sum is allocated.

Regarding the provisional sums allocated, PWA reserves the right to procure part of the list or none. In all cases PWA does not guarantee or promise to the tenderer anything in this regard. In an alternative scenario PWA may procure the said equipment from other in-house suppliers or external suppliers.

All the rental equipment has to be made available for use with 24 hours commitments in continuous use with drivers / operators, management and supporting staff.

The quoted rental price should be comprehensive which shall be including but not limited to following

- Associated wages, welfare and all other costs related to contractors employees (drivers, operators, supporting staff and management staff)
- All the costs related to management, maintenance and up keeping of vehicles / equipment
- All costs related to compliance with all rules, regulations and specifications
- Replacement costs of alternative vehicle / equipment in case of break down
- Costs of keeping management and work force available in all circumstances at all the time according to requirement at the site
- Cost of spare parts, accessories and tools to replace on spot when it is needed during operations
- Any other costs what so ever not listed above

Engineer has prepared a list of spare parts. The tenderer is required to stock the listed spare parts all the time as advised by the engineer

3.2 Lists of Vehicles / Equipment

A Regular Pooling Equipment

1 Cargo cranes with rope hook stowing device of 3.5 tons capacity

2 24 tons capacity GVW truck (6 x 4) with 9 ton cranes

3 18 tons tipper trucks w/10 tons play load capacity

4 13 tons capacity GVW hydraulic platform hoists with 15m reach

5 13 tons capacity GVW hydraulic platform hoists with 22m reach

6 16 tons capacity GVW hydraulic platform hoists with 34m reach

7 Telescopic boom forklifts – 15,000 Kgs capacity

8 0.6 cubic meter skid steer loader with backhoes

9 JCB 1600 lbs loaders with all accessories

10 Wheel loaders with 5.0 cubic meter bucket 115 KW

11 Double cabin pick up vehicles

12 10 tons single cabin traffic management vehicles

13 3,500 gallon water tankers w/ high pressure pump

14 Road sweepers vacuum type

15 Utility vehicles – SUV type

16 Recovery vehicles

17 Portable type traffic signals

18 Road marking equipment with erasing capability

19 Dumper trucks 'Ausa'

20 Double cabin trucks

B Auxiliary Pooling Equipment

1 Low bed trailers

2 Cranes 50 ton capacity

3 Cranes 100 ton capacity

4 Mini buses 26 seater 'Coaster'

5 Potable cabins with toilet, utility and consumables

6 Portable concrete mixers

7 Collision investigation vehicles

8 Browser Trailers which can be connected to Utiltity Vehicle

C Emergency Response Equipment

1 Truck mounted attenuators with complete accessories

2 Pot hole patching machines 5 ton capacity – Jet Patcher

3 Python pavement preserving machines 5 ton capacity

4 Static hot boxes – 30 ton capacity (Poetus)

5 Asphalt recycling machines

6 Modern combined IPV trucks with barrier rig

7 Tunnel washers – MULAG

8 Portable variable massage sign gantries

9 Portable genys 80 KVA with all purpose functionality, welding machine etc

D Secondary Response Equipment

1 HIABs with crane

2 Mechanical sweepers

3 Gully Carts / Jetters

4 50,000 gallon water tankers

5 4 x 4 SUVs for emergency response

6 Incident support units – ISU vans

7 Incidents Notifying Screens with Electronic Display

8 Forward Command Vehicles

9 Recovery Vehicles

10 Road marking machines (Hoffman / Borum)

11 Line marking erasers (Borum)

14 Water Pumps with long hose inlet / outlet

15 Mobile toilet trucks

D Collision Investigation Equipment

1 Light Meters

2 SCRIM Testers

3 Roads Marking Reflectivity Testers

4 Electronic Gradient Level Meters

5 Crash Investigation Vehicles

- The specification of the vehicles are required as follows to fulfil the scope of work, the Tenderer must indicate his compliance at Technical submittal stage by marking against each item as "Y = YES", or "N= NO" , if there is an alternative proposed need to mention in the in the Offer column provided.

- Technical submittal by contractor shall clearly specify any alternative options of each requirement, by clearly mentioning in the related table.

Spares Parts List Consumables (Generic)

Item	Description	Part Number	Stocking Advise (pieces)
1	Air filter element - inner / outer	5.001	4
2	Fuel filter element	5.002	4
4	Pre Cleaner	5.004	4
3	Oil Filter	5.003	4
5	Water Separator filter	5.005	1
6	Transmission Filter	5.006	2
7	Hydraulic Filter	5.007	4
8	Starter Motor	5.008	1
9	Alternator, Main and Sub Units	5.009	1
10	Fuel Pump	5.010	1
11	Fuel Pump repair kit	5.011	1
12	Fuel Lifting Pump	5.012	1
13	Injectors, Fuel	5.013	4
14	Water Pump	5.014	1
15	Water Pump Repair Kits	5.015	1
16	Radiator Hose (upper/lower)	5.016	2
17	Radiator Insulator	5.017	1
18	Engine Insulator	5.018	1

19	Radiator Assembly, including hoses	5.019	1
20	Radiator Cap	5.020	1
21	Cooling Fan, Radiator Fans	5.021	1
22	Fan Belts, Upper/Lower	5.022	1
23	Alternator Belts	5.023	2
24	Muffler, Exhaust Assembly	5.024	1
25	Seal Kit Tilt Jack	5.025	1
26	Seal Kit Lift jack	5.026	1
27	Brake Pads	5.027	9
28	Brake Master Cylinder	5.028	1
29	Hand Brake Switch	5.029	1
30	Hub Oil Seal / Inner	5.030	1
31	Hub oil Seal / Outer	5.031	1
32	Hub Bearing	5.032	1
33	Hub Cup O-ring	5.033	4
34	Wheel Studs and Nuts	5.034	5
35	Front Wheel Tyre Assembly	5.035	1
36	Rear Wheel Tyre Assembly	5.036	1
37	Hydraulic Pump	5.037	1
38	Hydraulic Hoses	5.038	4
39	Electrical Cables, approved rating for Motor Vehicle use	5.039	10
40	All Electrical Parts, Fuse, Plugs, Terminals	5.040	5
41	Ignition System Assembly	5.041	1
42	Starter Assembly	5.042	1
43	Front and Tail Lights	5.043	4
44	Signal and Break Lights	5.044	4
45	All set of tyres	5.045	4
46	Spare Steel Rims	5.046	1
47	All Battery set		1
48	Battery water		1
49	Hydraulic Fluids and Grease		1
50	Hydraulic Seals		4

3.3 **Equipment Management Software**

The contractor need to supply, install and commission a computerised system for management of all vehicles / equipment engaged in this contract.

The system shall have the required software installed at work station computer at the contractor's stores / office, where the data about the hire services details be maintained. The contractor shall install the client version / interface of this software at one of the designated computer of Ashghal at Salwa Compound, from where all the required data regarding hire services can be instructed, recorded and monitored online by the Ashghal.

The contractor shall make all necessary arrangement for making remote WAN link connection between the Server Computer at his office and the client Computer at the Ashghal. At the end of the contract period the contractor shall handover the Server Computer system with software and the database to Ashghal.

The related applicable software licences etc. need to be transferred on to PWA accordingly.

This is normally considered as subsidiary obligation to all the items in the bill of quantity however, an item provided in the preliminaries to fulfil this responsibility and obligation. The tenderer is advised to enter an appropriate amount for this item.

3.4 **Integration with control room and AVL**

In future some of the vehicles engaged through this contract may need to be equipped with AVL (Automatic Vehicle Location) devices.

The vehicles need to be equipped with Tetra Solution mobile devices and handsets, I pads etc. These devices will assist the operators to communicate and connect with the Control Room Staff.

A provisional sum is allocated for this requirement. If this requirement becomes necessary during this contract, the contractor need to co-ordinate with the Engineer in installations, testing and using those devices.

The contractor need to implement the policies and procedures becomes necessary in this regard.

3.5 Functional Specification / Each Equipment & Vehicle
Regular Pooling Equipment
1) CARGO CRANE W/ROPE HOOK STOWING DEVICE 3.5TONNE CAPACITY

S. No.	Description
1	Supply of an approved brand heavy duty Cargo Crane with rope hook stowing device 3.5 tons capacity in 4x2 truck chassis, not less than seven(7) Tonnes GVW drop side steel body with replaceable plywood wearing panels. GVW of minimum 1200 kg payload of minimum 5000 kg with front protection fence
2	Must be a forward control, single cabin, left hand drive, seating 2+1 or extended cab or equivalent.
3	Engine should be Euro 3 or 5 compliant 240/280.
4	Provision of all in stock safety and driving comfort features as supplied by the original equipment manufacturer OEM.
5	Supply one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and backside of the cabin.
6	Provide LED Type light bars, attached on the roof top of the tractor head, while two(2) amber rotating lights should be installed at the rear side of the truck with casing protection against breakage. Specifications for the LED light bars : a. Street Lazer 54" 1.37M 12 volts, 3amps. 80FPM b. Color, illuminates amber c. LED configuration :corner(4);front (4)&rear (7).
7	The truck bed and framing should be steel fabricated truck bed all welded steel construction to specification ST 37-1 or equivalent. total length should be 5.0 metres
8	Construction of the floor structure should be 150x75x6mm channels and be used as runner with sufficient brackets100x50x3mm formed channel will be used as floor cross member and 100x50x4mm channels as floor rails. Floors will be finished with 4mm checker plate.
9	Side guards should be provided as per standard, 80x40x2mm hollow tube. Connected with rigid hinges and heavy duty quality locks.(stainless or rigid steel). Vehicle side guard protection should be also designed according to space available.
10	Supply an approved brand "Hydraulic Crane" (3.5 to 4.5 Tonnes) capacity, it should be installed between the cab and the cargo body. Crane should pass all needed certifications required by Qatar Safety Standards and requirements that will be prescribed by a third party consultant.
	Install a two(2) section hydraulic telescopic boom rated at 4000 kg at 2.95 metres

11	radius and maximum lift height 12.5 metres, 360° boom rotation.
12	Provide a steel rope operated hook with "hook-in" specifications and hydraulically driven rope drum with overload protection system coupled with a warning horn.
13	Sequence of controls must "Dual Type Controls" on both sides of the vehicle with pressure load indicator visible to the operator.
14	Install two (2) high intensity working lights (round halogen type) should be installed under the truck bed to assist in night time operations.
15	Provision of one (1) heavy duty tow hook at the coupled to rear chassis for vehicle & equipment towing purposes.
16	Install four (4) pieces of side warning lamps yellow 2x4 inch dimension/size or equivalent alongside the side body of the truck to serve as warning to motorist on the roadway.
17	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight, Leatherman surge 21 Tools Herramientas and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.

2) 6X4, 24 TONNE GVW TRUCK WITH 9 TONNE CRANE (HIAB)

S. No.	Description
1	Supply an approved brand heavy duty,6x4 24 tons GVW Truck with 9 tonne crane, forward control long wheel base chassis of not less than 24000 kg GVW driven by a diesel engine developing not less than 360 HP. Engine should be Euro 3 or 5 compliant 240/280
2	Must be a "Forward Control", single cabin, left hand drive, seating 2+1 or with extended cab with rear bench seat fully air conditioned.
3	Should have all in stock safety and driving comfort features as supplied by the original equipment manufacturer OEM.
4	Provide one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and back drop side panel of the truck. (Please see WZTMG specification – For reference only).
5	Provide LED Type light bars, attached on the roof top of the tractor head, while two(2) amber rotating lights should be installed at the rear side of the truck with casing protection against breakage. Specifications for the LED light bars : a. Street Lazer 54" 1.37M 12 volts, 3amps. 80FPM b. Color, illuminates AMBER c. LED configuration: corner (4); front (4) & rear (7).
6	Provide a steel bed framing steel fabricated truck bed all welded steel construction to specification ST 37-1 or equivalent. total length should be 5.0 metres. Cargo flat-bed body with capacity of not less than 10,000 kg with drop sides and removable tailgate Approximate dimensions as prescribed : Length – 5000 mm Width – 2400 mm Height – 600 mm
7	Construction of floor structure should be 150x75x6mm channels will be used as runner with sufficient bracket 100x50x3mm formed channel will be used as floor cross member and 100x50x4mm channels as floor rails. Floors will be finished with 6mm checker plate.
8	All side guards will be provided as per standard, 80x40x2mm hollow tube. Connected with rigid hinges and high quality locking mechanism. All welded steel construction, framed 2 mm sheets head board to protect the crane Sub-frame of hot rolled channels – extended to rear of cabin for mounting the crane.
	Supply of brand new hydraulic crane (9 Tonne) capacity minimum, should be

9	installed between the cab and the side cargo body. Crane should pass all certifications required by Qatar safety standards as witnessed by an approving third party inspector.
10	Hydraulic lorry loader crane should be mounted between cab and body and with minimum performance of 9000 kg lift at 2.0 m radius 6200 kg lift at 4.0 m radius 4600 kg lift at 6.0 m radius 1000 kg. lift at 9.0 m radius Continuous 360^0 slewing
11	Install hydraulic outriggers front and rear, driven from the engine by PTO with warning lights with duplicated controls on both sides of the body.
12	Design a truck side guard protection should be in accordance to space available. This should prevent cars from crashing underneath the truck.
13	Installation of two (2) night working lights (round shaped halogen type) should be installed underneath the truck bed to assist in night time operations.
14	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.
15	Install four (4) side warning lamps yellow 2x4 inch dimension/size or equivalent alongside the side body of the truck to serve as warning to motorist on the roadway.
16	Provision of one (1) heavy duty tow hook at the coupled to rear chassis for vehicle & equipment towing purposes.

3) 18 TONNE TIPPER TRUCK W/ 10 TONNE PAYLOAD CAPACITY

S. No.	Description
1	Supply of an approved brand heavy duty 18 Ton Tipper truck with ten (10) ton Payload capacity, 4x2 chassis with wheelbase about 4100 mm and GVW about 18,000 kg with 10 ton payload tipper unit. Using a six (6) cylinder diesel engine of about 6000 cc developing not less than 250 HP Engine should be Euro 3 or 5 compliant 240/280.
2	Must be a "Forward Control", single cabin, left hand drive, seating 2+1 or with extended cab with rear bench seat fully air conditioned.
3	Provide all in stock safety and driving comfort features should be provided as supplied by the original equipment manufacturer OEM.
4	Provide one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and backside of the truck (Please see WZTMG specification – For reference only).
5	Install LED Type light bars, attached on the roof top of the cabin , while two(2) amber rotating lights should be installed at the rear side of the truck with casing protection against breakage. Specifications for the LED light bars : a. Street lazer 54" 1.37M 12 volts, 3amps. 80FPM b. Color, illuminates AMBER c. LED configuration :corner(4); front (4) & rear (7).
6	Provide a dump box with capacity not less than 5.0T payload capacity. Fabricated from 10-20mm thickness corrosion resistant steel or equivalent as recommended by the fabrication plant. Load volume of about 14m^3 capacity (not less than 10000 kg payload) with tailgate type body. Tipper unit specifications : 4 mm side plates with 3 mm inclined stiffeners 5 mm floor plates on 100 mm deep beams 4 mm headboard with stiffeners 3 mm canopy, contoured to protect the cabin.
7	Approximate dimensions of the supplied equipment should be : Length 5000 mm Width 2100 mm Height 550 mm
8	Provision of rear dumping with double action hydraulic rams tipping to 50^0 for easy removal of material. Hydraulic rams should be properly designed to lift the 5 tonne dead load and consider the power take off PTO requirements of the hydraulic pump designed for raising the load off the dump box.

9	All controls should be located inside the cabin of the truck with all safety features as prescribed by the truck original equipment manufacturer OEM.
10	Vehicle side guard protection should be also designed according to space available. This should prevent cars from crashing underneath the truck.
11	Provision for an access ladder strategically designed for maintenance works.
12	Provide a dump box cover and side hooks to anchor the strings that will hold the cover while on travel.
13	Provide two (2) high intensity night working lights and should be installed underneath the truck bed to assist in night time operations. This should be rotatable by 180° for ease in use.
14	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.

4) 13 TONNE GVW HYDRAULIC PLATFORM HOIST WITH 15M REACH

S. No.	Description
1	Supply of an approved brand heavy duty 13 Ton GVW Hydraulic Platform Hoist with 15M reach, 4x2 chassis with wheelbase about 4100 mm and GVW about 13,000 kg. Using a six (6) cylinder diesel engine developing not less than 160 HP. Engine should be Euro 3 or 5 compliant 240/280.
2	Must be a "Forward Control", single cabin, left hand drive, seating 2+1 or with extended cab with rear bench seat fully air conditioned.
3	Provide all in stock safety and driving comfort features as supplied by the original equipment manufacturer OEM.
4	Provide one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and backside of the truck.
5	Install LED Type light bars, attached on the roof top of the cabin , while two(2) amber rotating lights should be installed at the rear side of the truck with casing protection against breakage. Specifications for the LED light bars : a. Street lazer 54" 1.37M 12 volts, 3amps. 80FPM b. Color, illuminates AMBER c. LED configuration :corner(4); front (4) and rear (7).
6	Provide a chassis to be fitted with a standard 15 metre working height platform hoist chassis to be approved by hoist manufacturer with 3 mm canopy, contoured to protect the cabin.
7	Should be meeting the following dimensions for the Vehicle/Equipment : Max working height – 15 m Max working cage floor height – 9 m Max working horizontal reach – 7 m
8	Provide a safe man-lift basket working load not less than 250 kg (size & area of platform to carry two(2) workmen. Basket should be tested for all inspection requirements to be prescribed by a third party assessor TPA.
9	All controls should be located inside the cabin of the truck with all safety features as prescribed by the truck original equipment manufacturer OEM.

10	Provide four (4) independently operable hydraulic stabilizer with warning lights and integral safety check valves 2 way boom / stabilizer interlocks to prevent operation of either out of sequence.
11	Design and supply a crane lower boom articulating through $80^{0.}$
12	Crane rotation should be 360^{0} continuous, swing & turns. With safety precautionary safety override feature.
13	Must have the following platform of GRP or other suitable material : • Reinforced handrail with knuckle guard • Side access • Non slip floor (checkered 10mm plates) • Safety harness anchorages (2) • Movement control station with hooded protection • Insulation working – 2000V • Insulation test / 4 min. – 3000V With all approved safety signage and reminders as prescribed by international safety standards.
14	Install a hydraulic platform, preferably powered by auxiliary diesel engine with electric start, or PTO from main engine.
15	Provide a suitable hydraulic pump to support single or dual hydraulic rams. Pump should be at least 150% rated versus the crane lift capacity with all factor of safety FS considerations.
16	Provision of access decking / ladders for maintenance and routine works.
17	Should have dual controls from cage and base, with full shut down features in the controls.
18	All hydraulic pipes should be carried inside the boom pipes for protection from damaged and corrosion.
19	Install a full safety features including restrictor valve to control descent, automatic safety stops lock valve on boom cylinder, safety lock and motion control valves integral with all cylinders etc.
20	Supply two (2) night working lights (halogen) should be installed strategically on the truck cabin or recommended location to assist in night time operations.
21	Fabricate and install a vehicle side guard protection be designed according to space available under the truck bed. This will prevent cars from crashing underneath the truck
22	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.

5) 13 TONNE GVW HYDRAULIC PLATFORM HOIST W/22M REACH

S. No.	Description
1	Supply an approved brand heavy duty 13 Ton GVW hydraulic platform hoist with 22M Reach, 4x2 chassis with wheelbase about 4100 mm and 13 tonne. Using a six (6) cylinder diesel engine developing not less than 160 HP. Engine should be Euro 3 or 5 compliant 240/280.
2	Must be a "Forward Control", single cabin, left hand drive, seating 2+1 or with extended cab with rear bench seat fully air conditioned.
3	Provide all in stock safety and driving comfort features as supplied by the original equipment manufacturer OEM.
4	Provide one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and drop side of the truck .
5	Supply and Install LED Type light bars, attached on the roof top of the cabin , while two(2) amber rotating lights should be installed at the rear side of the truck with casing protection against breakage. Specifications for the LED light bars : a. Street lazer 54" 1.37M 12V, 3amps. 80FPM b. Color, illuminates AMBER c. LED configuration :corner(4);front (4)& rear(7).
6	Provide a chassis to be fitted with a standard 22 metre working height platform hoist chassis to be approved by hoist manufacturer with 3 mm canopy, contoured to protect the cabin.
7	Specifications of working height clearance should be : Max working height – 22 metres Max working cage floor height – 20 m Max working horizontal reach – 10 m
8	Required safe working load should be not less than 250 kg (size & area of platform to carry two (2) workmen safely inside the basket.)
9	All controls should be located inside the cabin of the truck with all safety features as prescribed by the truck original equipment manufacturer OEM.
10	Provision of four (4) independently operable hydraulic stabilizer with warning lights and integral safety check valves. Two(2) way boom / stabilizer interlocks to prevent operation of either out of sequence.
11	Design and supply a crane lower boom articulating through $80^{0.}$

12	Crane rotation should be 360^0 continuous, swing & turns.
13	Platform of GRP or other suitable material should comply with the following : • Reinforced handrail with knuckle guard • Side access • Non slip floor (checkered 10mm plates) • Safety harness anchorages (2) • Movement control station with hooded protection • Insulation working – 2000V • Insulation test / 4 min. – 3000V With all approved safety signs needed.
14	Install a hydraulic platform, preferably powered by auxiliary diesel engine with electric start, PTO from main engine.
15	Provide a suitable hydraulic pump to support single or dual hydraulic rams. Pump should be at least 150% rated versus the crane lifting capacity with all factor of safety FS considerations.
16	Access decking / ladders should be fabricated on the truck body. Should be fixed design on the truck body or chassis.
17	Dual controls from cage and base, with full shut down features and easy to operate lever controls. All control should be fully labelled.
18	All hydraulic pipes should be carried inside boom pipes for protection against damage and corrosion.
19	Install safety features in the design of controls including restrictor valves to control descent, automatic safety stops lock valve on boom cylinder, safety lock and motion control valves integral with all cylinders etc. as prescribed by the equipment manufacturer.
20	Provide four (4) night working lights should be installed strategically on the truck cabin or recommended location to assist in night time operations. This should be halogen type lighting adjustable in 180° rotation.
21	Vehicle side guard protection should be also designed according to space available. This should prevent cars from crashing underneath the truck
22	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.

6) 16 TONNE GVW HYDRAULIC PLATFORM HOIST W/34M REACH

S. No.	Description
1	Supply an approved brand heavy duty 16 Ton GVW Hydraulic Platform Hoist with 34M Reach, 4x2 chassis with wheelbase about 4100 mm and GVW about 16,000 kg. Using a six (6) cylinder diesel engine developing not less than 160 HP. Engine should be Euro 3 or 5 compliant 240/280.
2	Must be a "Forward Control", single cabin, left hand drive, seating 2+1 or with extended cab with rear bench seat fully air conditioned.
3	Provide all in stock safety and driving comfort features as supplied by the original equipment manufacturer OEM.
4	Install one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and backside of cabin.
5	Provide LED Type light bars, attached on the roof top of the cabin , while two(2) amber rotating lights should be installed at the rear side of the truck with casing protection against breakage. Specifications for the LED light bars : a. Street lazer 54" 1.37M 12 volts, 3amps. 80FPM b. Color, illuminates AMBER c. LED configuration: corner(4); front (4) & rear (7)
6	Supply a reinforced steel chassis to be fitted with a standard 34 metre working height platform hoist chassis to be approved by hoist manufacturer with 3 mm canopy, contoured to protect the cabin.
7	Specifications of working height clearance should be : Max working height – 34 m Max working cage floor height – 22 m Max working horizontal reach – 10 m
8	Provide a safe working load not less than 250 kg (size & area of platform to carry two (2) workmen.
9	Install all controls should be located inside the cabin of the truck with all safety features as prescribed by the truck original equipment manufacturer OEM.
10	Provide four(4) independently operated hydraulic stabilizer with warning lights and integral safety check valves. Two (2) way boom / stabilizer interlocks to prevent operation of either out of sequence.

11	Lower boom should be articulated through 80^0
12	Required rotation of the crane should be 360^0 continuous. With safe protection override systems.
13	Supply platform of GRP or other suitable material with the following : • Reinforced handrail with knuckle guard • Side access • Non slip floor (checkered 10mm plates) • Safety harness anchorages (2) • Movement control station with hooded protection • Insulation working – 2000V • Insulation test / 4 min. – 3000V With all approved safety signage and reminders as prescribed by international safety standards.
14	Install a hydraulic platform, preferably powered by auxiliary diesel engine with electric start, or PTO from main engine.
15	Provide suitable hydraulic pump not lower than 50GPM or higher to support single or dual hydraulic rams to power up the crane arm and lift the basket with maximum load of 250kgs.
16	Provide a specially designed access decking / ladders for maintenance purposes and ease in operations.
17	Install dual control sequence from cage and base, with full shut down and emergency features.
18	Ensure all hydraulic pipes to be carried inside boom pipes for protection against damaged or puncture.
19	Install safety features including restrictor valve to control descent, automatic safety stops lock valve on boom cylinder, safety lock and motion control valves integral with all cylinders etc.
20	Provide four(4) night working lights should be installed strategically on the truck cabin or recommended location to assist in night time operations. Lamps should be halogen type full swing adjustment 180°.
21	Construction the vehicle side guard protection should be in accordance with space available. This should prevent cars from crashing underneath the truck
22	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.

7) FORKLIFT – TELESCOPIC 15, 000 KGS CAPACITY

S. No.	Description
1	Supply an approved brand Telescopic Boom Forklift 15, 000 kgs capacity with all required accessories for lifting loads, such as sling, chains and lift locking devices for loads.
2	• An approved brand diesel engine with not less than 62 KW 82 HP engine power rating. Coupled with all auxiliary components to run the engine.
3	Should be provided two(2) - range hydrostatic transmission system.
4	Provide a four (4) wheel drive with rigid tyres for all terrain use.
5	Required dimensions should be 2.1m high x 2m wide, Normal configurations will be also accepted.
6	Should meet maximum load 2700 kg vertical lift to height of 5.5.m under normal operating conditions.
7	Required turning radius : 3.0 meter for the front wheel
8	Should have a wide "Walk-In Cab".
9	Unit should be supplied with large roof windows, with all side view mirrors for drivers full back side view.
10	Provision of joystick controls with proper labelling and locking mechanism.
11	Supply and install one (1) piece engine bonnet for easy servicing with safety locks and audible alarm controls.
12	Equipment supplied should meet the following speed requirements max speed of 30 kph and min. of 10 kph.
13	Provide one (1) set body striping for the equipment, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film.
14	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit and UK approved first aid kit. Secured in the drivers dashboard compartment.
15	Provide two(2) amber rotating lights should be installed on the roof of the cabin with casing protection against breakage.

8) 0.6 CUBIC METER SKID STEER LOADER WITH BACKHOE

S. No.	Description
1	Supply an approved brand heavy duty 0.6 Cubic Meter Skid Steer Loader with Backhoe four (4) wheel drive compact size tractor shovel for digging & loading with heaped bucket JCB or any equivalent offer.
2	Provided with a water cooled diesel engine developing about 42 kw @ 2000 rpm.
3	Equipment should be a four (4) wheel drive system with variable forward & reverse speeds travelling 0-20 km/hr.
4	The steering system should be hydrostatic skid steer or conventional type, forward and reverse control as standard movement.
5	Install triple side enclosure with roll-over protection cab with safety lock-out system. Fitted with lifting rings on top of the cab.
6	Static Dimensions should be supplied as follows : Payload – 7947 kg Bucket capacity – 04 m^3 Dump height 0.81M Travelling speed – 0-20 kph Transport length - 7.49M Height - 2.87 M Overall width - 2.44M
7	Provide the attachments as follows : Machine should capable of operating optional attachment by mechanical coupler. -A backhoe attachment suitable for the machine capability should be provided (as detailed) (# 9.1 requirements of the supplied attachments) backhoe (# 9.2 requirements).
8	Supply of brand new wheel spanner and set of original equipment manufacturer OEM set of tools supplied with the unit.
9	Provide one (1) set body striping for the equipment , should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film.
10	Install two (2) amber rotating lights should be installed on the roof of the cabin with casing protection against breakage.
11	Provision for a suitable fire extinguisher A,B&C grade with complete tool box kit and UK approved first aid kit, located inside the drivers dashboard cabin compartment.
12	Install two (2) high intensity night working lights (halogen type) to be installed on the front side to assist operations during night time and for better visibility. .
13	Provide two (2) oval shaped side mirrors located in the front side bars of the equipment.

14	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.

9) JCB LOADER 1600 LBS CAPACITY WITH ACCESSORIES

S. No.	Description
1	Supply an approved brand heavy duty (JCB) Loader 1600 Lbs, capacity with all standard accessories. Drive compact size tractor shovel for digging & loading with heaped bucket JCB original supply.
2	Provided with a water cooled diesel engine developing about 42 kw @ 2000 rpm.
3	Equipment should be a four (4) wheel drive system with variable forward & reverse speeds travelling 0-20 km/hr.
4	The steering system should be hydrostatic skid steer or conventional type, forward and reverse control as standard movement.
5	Install triple side enclosure with roll-over protection cab with safety lock-out system. Fitted with lifting rings on top of the cab.
6	Static Dimensions should be supplied as follows : Payload – kg Bucket capacity – m^3 Dump height M Travelling speed – 0-20 kph Transport length - 7.49M Height - 2.87 M Overall width - 2.44M
7	Provide the attachments as follows : Machine should capable of operating optional attachment by mechanical coupler. -A backhoe attachment suitable for the machine capability should be provided (as detailed) (# 9.1 requirements of the supplied attachments) backhoe (# 9.2 requirements).
8	Supply of brand new wheel spanner and set of original equipment manufacturer OEM set of tools in a suitable rigid tool box (SNAP-ON Tools Set) as supplied with the unit.
9	Provide one (1) set body striping for the equipment , should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film.
10	Install two (2) amber rotating lights should be installed on the roof of the cabin with casing protection against breakage.

11	Provision for a suitable fire extinguisher A,B&C grade with complete tool box kit and UK approved first aid kit, located inside the drivers dashboard cabin compartment.
12	Install two (2) high intensity night working lights (halogen type) to be installed on the front side to assist operations during night time and for better visibility. .
13	Provide two (2) oval shaped side mirrors located in the front side bars of the equipment.
14	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.

10) WHEEL LOADER WITH 5.0 CUBIC METER BUCKET 115KW

S. No.	Description
1	Supply an approved brand Wheel Loader 3500kg rated load, 5.0 cubic meter Bucket Capacity, powered with 115KW or equivalent rated diesel engine @2200 rpm, planet type power transmission with 2 forward and 1 reverse gear, fully hydraulic amplified power steering system. first brand working and steering pumps, hydraulic cylinders, hoses and tubes,
2	Provide an air conditioned steel and glass enclosure operator cabin with all installed seating comfort.
3	Construction of framing should be, rigid steel high quality frames, arms, cabin, fuel/oil tanks and hood.
4	Wheel base required should be heavy duty long wheel base with steering angle of 36° as minimum turning radius.
5	Operations of the unit should be controlled by, pilot joystick, rock bucket, bigger bucket log grapple. Must be easy and failure free to operate.
6	Operations must be by a gear pump driven, 16MPa to drive the lifting cylinder and tilting cylinder (125x816mm & 140x533mm bore and stroke size respectively)
7	Braking system design should be : air over hydraulic disc on four (4) wheel brakes.
8	Must have a fuel tank capacity @ 200liters, engine oil 15L, Transmission 30L, Hydraulic Tank Oil 140L trans axle 30L
9	Install two(2) night working lights (halogen type) to be installed on the front side to assist operations during night time and for better visibility.
10	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.
11	Provide one (1) set body striping for the crane body and arm , should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film.

12	Provide two(2) amber rotating lights should be installed on the roof of the cabin with casing protection against breakage

11) DOUBLE CABIN PICK-UP VEHICLE

S. No.	Description
1	Supply an approved brand double cabin pick up vehicle, 4x2 chassis 5-speed manual/automatic transmission with wheelbase about 3085 mm and GVW 1863kg with a minimum payload of 2000kg (carrying capacity). Toyota Hi Lux or equivalent offer.
2	Provide an engine as specified, should be a 2.5Liter gasoline fed engine 4 cylinder 16V DOHC with Turbo.
3	Vehicle must have the following dimensions overall Length, Width and Height 5255 x 1760 x 1820mm
4	Provision of a five (5) seating capacity fully air conditioned crew cabin with full features of a standard cabin as supplied with the Original Equipment Manufacturer OEM.
5	The loading bed should be protected with a hard plastic bed liner to protect the body from scratches and dent.
6	Provide one (1) set body striping for the vehicle body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign on the tail gate.
7	Install brand new LED Type light bars, rigidly attached on the roof top of the cabin. This Specifications for the LED light bars : a. Street lazer 54" 1.37M 12 volts, 3amps. 80FPM b. Color, illuminates AMBER c. LED configuration :corner(4); front (4) & rear (7)
8	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.

12) 10 TONNE SINGLE CABIN TRAFFIC MANAGEMENT VEHICLE

S. No	Description
1	Supply an approved brand 10 ton single cabin traffic management vehicle, heavy duty,4x2 truck chassis, not less than (7.5) Tonnes GVW drop side steel body with replaceable ply board wearing panels. GVW of minimum 4000 kg payload.
2	Provide a forward control, double cabin, left hand drive, seating 2+1 or extended cab with rear bench seat.
3	Engine should be Euro 3 or 5 compliant 240/280 in compliance with environmental standards.
4	Supply all in stock safety and driving comfort features as supplied by the original equipment manufacturer OEM.
5	Truck bed should be provided with pre designed access point, cone well/stairs designed by the truck bed fabricator.
6	Install a Half tail lift – used to transport temporary traffic lights intact or lift debris recovered from the road and install tapers in the road network. Mechanism should be provided with chevron hi-intensity markings as prescribed in paragraph 16 of this specifications.
7	Provide a heavy duty "Tow Bar" mechanism coupled to the chassis for towing equipment and vehicle.
8	Supply and install an LP13 directional arrow board vehicle mounted with 13 Amber LED Lamps mounted on a four foot hazard warning on grey colored backing board – useful for hard shoulder or on single carriageway.
9	Provide one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and backside of the truck body.

10	Install LED Type light bars, attached on the roof top of the tractor head, while two(2) amber rotating lights should be installed at the rear side of the truck with casing protection against breakage. Specifications for the LED light bars : a. Street Lazer 54" 1.37M 12 volts, 3amps. 80FPM b. Color, illuminates amber c. LED configuration: corner(4);front (4) & rear (7).
11	Supply and install (2) two units high intensity halogen type lights positioned strategically to assist night time operations.
11	Construct a steel fabricated truck bed all welded steel construction to specification ST 37-1 or equivalent. total length should be 5.0 metres
12	Floor structure should be 150x75x6mm channels and be used as runner with sufficient brackets100x50x3mm formed channel will be used as floor cross member and 100x50x4mm channels as floor rails. Floors will be finished with 4mm checker plate.
13	Side guards provided should be as per standard, 80x40x2mm hollow tube. Connected with rigid hinges and heavy duty quality locks.(stainless or rigid steel). Vehicle side guard protection should be also designed according to space available.
14	Construct a 4 section framing design as prescribed in the illustrated photo in the BOQ #14. Specifications may vary with the offered truck dimensions, while the design should be almost the same or equivalent.
15	Provide (2) high intensity night working lights halogen round type should be installed under the truck bed to assist in night time operations
16	Install four (4) side warning lamps yellow 2x4 inch dimension/size or equivalent alongside the side body of the truck to serve as warning to motorist on the roadway.
17	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.

(13) 3. 500 GALLON WATER TANKER W/HIGH PRESSURE PUMP

S. No.	Description
1	Supply an approved brand heavy duty 3500 gallon water tanker with high pressure pump. 4x2 chassis with wheelbase about 4100 mm and GVW about 18,000 kg. Using a six (6) cylinder diesel engine developing not less than 160 HP. Engine should be Euro 3 or 5 compliant 240/280.
2	Provide a "Forward Control", single cabin, left hand drive, seating 2+1 or with extended cab with rear bench seat fully air conditioned.
3	Supply all in stock safety and driving comfort features as supplied by the original equipment manufacturer OEM.
4	Provide one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and backside of the truck attached on a pre-fabricated aluminium frame.
5	Install LED Type light bars, attached on the roof top of the cabin , while two(2) amber rotating lights should be installed at the rear side of the truck with casing protection against breakage. Specifications for the LED light bars : a. Street lazer 54" 1.37M 12 volts, 3amps. 80FPM b. Color, illuminates AMBER c. LED configuration: corner(4); front (4)&rear (7).
6	Provide a rigid and suitable chassis to carry a standard 3500 gallon heavy duty steel tank A-36 or Polibrid 705 with an approximate length of (6.096M) and height of (1.90M).
7	Install a suitable high pressure pump not less than 80 GPM @ 2600 PSI (303 LPM @180 bar) . Power Take Off PTO driven pump as the mechanics for water spraying. Pump should be capable of running dry without damage.
8	Provision of water pump with automatic impulse action to aid break up of blockages. 5 spray heads and not less than 100M in hose length in two(2) sets.
9	Supply a Left side spray head with 1 ½ outlet, in hose reel 100M in length top mount in-cab controlled water canon.
10	Provide controls for start/stop, dump and continuously varying output from 0-80 GPM located at the rear of the vehicle secured lockable box compartment.
11	Supply a hydraulically powered hose reel with min of 180° of articulation and capacity of upto 200 m of 180 BAR 1" hose, c/w hose guide.

12	All controls should be located inside the truck cabinet with all safety features as prescribed by the truck original equipment manufacturer OEM.
13	Supply of 100 metres of 1.5" nominal SAE J517C -100 R2 oil resistant rubber hose with max. working pressure of 300BAR c/w BSP straight swivel female fitting one end, BSP 90° compact elbow swivel female on the other.
14	Provide (2) night working lights should be installed strategically on the truck cabin or recommended location to assist in night time operations.
15	Install a vehicle side guard protection should be also designed according to space available. This should prevent cars from crashing underneath the truck.
16	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.
17	Provide two(2) amber rotating lights should be installed on the rear side of the truck with casing protection against breakage/damage.

14) ROAD SWEEPER VACUUM TYPE

S. No.	Description
1	Supply an approved brand Road Sweeper Vacuum Type, heavy Duty,4x2 truck chassis, not less than 16000 Tonnes GVW, wheel base of 3780mm water cooled diesel engine developing a net power of 140HP. All in stock safety and driving comfort features as supplied by the original equipment manufacturer OEM VT651 Mcdonald Johnston.
2	Should be a forward control, single cabin, left hand drive, seating 2+1 or extended cab if available. All in stock safety and driving comfort features as supplied by the original equipment manufacturer OEM.
3	Engine should be Euro 3 or 5 compliant 240/280 in compliance with environmental standards in emission.
4	Supply a unit with a fully automatic 4-speed transmission with power assisted steering with air brakes and ABS.
5	Provision of full instrumentation to include water temperature, oil pressure, ammeter, fuel meter, speedometer, air pressure gage, and necessary safety controls warning light s for the truck and vacuum equipment.
6	Provide one (1) diagnostics laptop for servicing and maintenance purposes. Operations and Maintenance CD's and manuals should be also provided.
7	Supply suitable size of tyres and spare wheels with tyres, tubes, wheel spanner and 10T heavy duty jack. Tyre brands should be preferably recognized European brand.
8	Provide 24V electrical system with heavy duty battery and alternator, full lighting equipment and horns; reverse alarms and spotlights; night working lights on the side of the truck and spare sockets external use. and all external loom are IP67 rated.
9	Construction of Frames, axles and springs, shock absorbers, wheels, tyres and equipment must be to correct specifications for the required GVW. Full details of all these items must be included in the tender together with the OEM printed specifications/ drawings.
10	Provide one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and backside of the truck using an aluminium frame.

11	Install LED Type light bars, attached on the roof top of the tractor head, while two(2) amber rotating lights should be installed at the rear side of the truck with casing protection against breakage. Specifications for the LED light bars : a. Street Lazer 54" 1.37M 12 volts, 3amps. 80FPM b. Color, illuminates amber c. LED configuration: corner(4);front (4)&rear (7).
12	Provide an LP13 directional arrow board (vehicle mounted with 13 Amber LED Lamps mounted on a four foot hazard warning on grey colored backing board – useful for hard shoulder or on single carriageway. Refer to LP 13 mini light arrow board specifications as supplied by (NISSEN).
13	Supply the following requirements as follows : Specifications: Channel Brush : 650mm Wide Sweep Brush : 406mm Accumulated Life Expectancy : 150 hours use Brushes should be quick release brush system with a nominal 160-200 rpm rotation variable speed.
14	Capacity requirement should be : Hopper Voided Volume : 6.5m³ nominal Payload Voided Volume : 5.6m³ nominal Body paint : Off White glossy paint Payload Capacity : 4-5 Tonnes Fuel Tank : 190 Litres Water Tank : 1600 Litres Hydraulic System : 75 Litres
15	Supply of vacuum specifications should be meeting the following requirements : Discharge Height : 950mm Discharge Angle : 54° nominal Door opening angle : 125° nominal Filter mesh area : 1.05m³ Dust spray pump output : Up to 35 LPM Dust spray water pressure : 3.5 BAR Hydraulic Suction filtration : 125 micron Hydraulic return filtration : 25 micron Hydraulic pump displacement : max. output 32 litres Sweeping Speed : 2 – 15 KPH Nozzle Trunking Diameter : 250mm (Cast Aluminium and tool free adjustment) Nozzle width : 750mm
16	Body construction should be, comprising the hopper and integrated pressurized water tank 250 litre capacity fabricated from heavy duty stainless steel plate. Water tank should be integrated into the body assembly, incorporate anti surge baffles and filled via A-Type water hydrant filler.

17	Cowl should be manufactured from stainless steel plate , is lined with the frequency matched soundproofing material
18	Construction of the rear door should be, water tight twin lock rear door latching system with de-watering function.
19	Supply and design with two(2) access doors located on the left and right position of the truck body.
20	Exhauster fan design should have variable speed of 2400 – 3500rpm to suit the operation. Driven by the auxiliary engine via step up gear box and fluid flywheel coupling.
21	Supply a dust suppression system complies with SCAQMD rule 1186 standards with sprays located at the suction nozzles channel brushes and across front of the vehicle. Pressadrain water purging system.
22	Provision of control panel should be located at the middle portion the cab, Johnston Visual Module (JVM) master control panel providing information on a wide range of sweeper functions plus data capture download.
23	Provide an E-Pod sweep controls , ergonomically positioned and housing al main sweeper control functions for ease of operation and comfort.
24	Sweeper should be equipped with these Standard Options : • Rear discharge chute with side retainers • Automatic Multi-position • Side lockers for tools and spares parts • Plug in hopper floor, as Transfer port for use as street washer. • Supawash – high pressure 32 lpm @10 BAR with hand wash and hose reel. • Pneumatic mesh screen shakers. • Narva LED Tail Lights, Rear Search Lamps, • CCTV Camera and Monitor System • Auto greasing system – allenlube (truck & body). • Air Horn • Rust proofing • Seat covers and Floor Matting
25	Equipment should be provided with all the standard recommended spares and consumables for daily operations all throughout this contract
26	Provide an easy access ladder for maintenance works on the emulsion tank and the compressor area. Please refer to photo illustration as per BOQ #18.
27	Provision of one (1) heavy duty tow hook at the coupled to rear chassis for vehicle

	& equipment towing purposes
28	Install eight(8) side warning lamps yellow 2x4 inch dimension/size or equivalent alongside the side body of the truck to serve as warning to motorist on the roadway.
29	Provide a suitable fire extinguisher A,B&C grade 10kg with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin. Must also include 2 pieces of body harness for maintenance use above the tank.
30	Install two(2) amber rotating lights and should be installed on the rear side of the truck with casing protection against breakage/damage.

15) UTILITY VEHICLES – INSPECTION UTILITY

S. No.	Description
1	Supply an approved brand Sports Utility Vehicle SUV type 4.0 litre V6 gasoline engine (1GR-FE) 24 Valve DOHC with dual VVT-I electronic fuel injection 5-speed super intelligent ECT, sequential shift transmission, wheelbase about 2790 mm and GVW 2990kg.
2	Provide a 4.0 Litre gasoline fed engine V6 cylinder DOHC with Turbo. Electronic Fuel injection developing with a maximum torque of 38.9kg-m @4400 RPM
3	Required overall vehicle length 4780, Width 1885 and Height 1835 mm or equivalent.
4	Provide a unit with seven (7) seating capacity fully air conditioned crew cabin with full features of a standard crew cabin.
5	Supply of safety equipment, air bags for both driver & passenger, an automatic braking system ABS and all standard safety features as provided by the vehicle manufacturer.
6	Provide one (1) set body striping for the vehicle body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign on front and rear tyre cover of the vehicle.
7	Install LED Type light bars, attached rigidly on the roof of the car. Attached unit should be able to withstand speeds of 120kph without vibrations Specifications for the LED light bars : a. Street lazer 54" 1.37M 12 volts, 3amps. 80FPM

	b. Color, illuminates AMBER c. LED configuration :corner(4); front (4) & rear (7)
8	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.
9	Supply a heavy duty tools rack, preferably plastic material that can hold the following : a. Wheel meter, b. Portable signage, c. Flashlight, d. Raincoat, e. Traffic cones, f. Water container, g. Hard hat, h. Personal protective equipment i. 10kg A,B &C fire extinguisher. All consumables will be also supplied alongside with all the vehicles on as need basis. Properly secured and stacked inside the vehicle to avoid any tools /materials that will serve as projectile during sudden brake/stop.

16) RECOVERY VEHICLE

S. No.	Description
1	Supply an approved brand recovery vehicle 4x2 chassis with wheelbase about 4100 mm and GVW about 14,000 kg with 7 ton payload tipping body for hauling cars, SUV and road works traffic management equipment for safety.
2	Provide a forward control, double cabin, left hand drive, seating 2+1 or extended cab with rear bench seat.
3	Engine should be a six(6) cylinder diesel engine of about 6000 cc developing about 180 HP minimum. Engine should be Euro 3 or 5 compliant 240/280 Vehicle dimensions should be as follows: Length 5500 mm Width 2100 mm Height 550 mm
4	Provide LED Type light bars, while two(2) amber rotating lights should be installed at the rear side of the unit with casing protection against breakage. Specifications for the LED light bars : a. Street Lazer 54" 1.37M 12 volts, 3amps. 80FPM b. Color, illuminates amber

	c. LED configuration: corner(4);front (4)&rear (7).
5	Install eight(8) side warning lamps yellow 2x4 inch dimension/size or equivalent alongside the side body of the unit to serve as warning to motorist on the roadway.
6	Provide one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and backside of the truck cabin(Super imposed on a plain sheet of metal).
7	Supply a tipper type platform of about 5.0m in length capacity (not less than 10000 kg payload) with tailgate type body with tipping gear and power take- off mechanism.
8	Construction of steel fabricated truck bed all welded steel construction to specification ST 37-1 or equivalent. total length should be 5.0 metres.
9	Install a suitable high pressure PTO pump not less than 450 GPM. To power off the winch with suitable cables to pull a minimum of 6 ton vehicle or equipment.
10	Frame, axles and springs, shock absorbers, wheels, tyres and equipment must be to correct specifications for the required GVW. Full details of all these items must be included in the tender together with the OEM printed specifications/ drawings.
11	All controls should be located in between the truck and the tipper platform truck through a wired joystick or push button controls with all safety features such as emergency stop button and overload protection systems prescribed by the PTO original equipment manufacturer OEM.
12	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.

17) PORTABLE TYPE TRAFFIC SIGNAL

S. No.	Description
1	Supply an approved brand compact and portable Traffic Control Signal operated by a rechargeable battery solar powered charged by sunlight. Should be operating with minimal power consumption. LZA 500 Nissen or equivalent.
2	Provided with LED lamps, green, red & yellow with robust polycarbonate lens with contrast shield for superior visibility.
3	Provide the controller facing away from the traffic as safety design of the unit and a lighted display unit for night time use.
4	Supply a display light for night time use and a multi frequency technique for radio operation. Radio system will be based upon the agreed overall communications set up for all the operatives.
5	Provide a unit equipped with radar sensor for traffic density sensing and alarm system link to a remote controller. Supplied with an "imitator" with Bluetooth as link modem.
6	Must be suitable for two-way multi-purpose operations with pre-programmed selection table from the Portable Traffic Signal for the control of Vehicular Standards and basically should be user friendly.
7	Supply of a small pilot console battery operated for data transfer and programming in it's central control system.
8	Units supplied should have a fabricated protective housing or travel luggage type for safekeeping purposes and securing the LED lights.

18) ROAD MARKING EQUIPMENT WITH ERASING CAPABILITY

S. No.	Description
1	Supply of an approved brand Road marking Equipment Borum or equivalent with Road Mark Erasing Equipment. Engine type, Fuso canter 7.5Tonne GVW Using a six (6) cylinder diesel engine developing not less than 145 HP. Engine should be Euro 3 or 5 compliant 240/280.
2	Provide a forward control, crew cabin 1+2 persons , left hand drive, or with extended cab with rear bench seat and fully air conditioned.

3	Supply all in stock safety and driving comfort features as supplied by the original equipment manufacturer OEM.
4	Supply a 710 litre non-pressurized tank with a 650 litre pressurized tank or 2x440 litre pressure tanks for cold painting. The bead tank should not be less than 330 litre in space capacity.
5	Design and supply a spray gun system with triple nozzles that are mounted on sledges which can be hydraulically extended and retracted. This sledge control should ensure better line quality even during higher speeds.
6	Provide one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and backside of the truck. Livery design should be approved by Ashghal prior to any installation on the truck body.
7	Provide a 5.0M long galvanised traffic management body as describe in BOQ reference illustration #24. Rear side of the truck will house the compressor and all tanks with or without pressure. .
8	Install a brand new LP13 directional arrow board (vehicle mounted with 13 Amber LED Lamps mounted on a four foot hazard warning on grey colored backing board – useful for hard shoulder or on single carriageway. Refer to LP 13 mini light arrow board specifications from (NISSEN).
9	Install two(2) amber rotating lights and should be installed on the rear side of the truck with casing protection against breakage/damage.
10	Two(2) Night working lights should be installed strategically on the truck cabin or recommended location to assist in night time operations.
11	Vehicle side guard protection should be also designed according to space available. This should prevent cars from crashing underneath the truck
12	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.
13	Supply a steel tool box with compartments located under the truck bed for placement of maintenance tools such as compressor hose extension, electrical cable extension for the genset, hand tools such as wrench, socket wrench, bolt or fence cutters and other tools as prescribed in item#21.
14	Supply a brand new H92-1 Hoffman Line Eraser that is powerful hand guided, self - propelled line remover, suitable for removal of all types of marking on shorter sections.

15	The following technical data should be complied in the supply of this line eraser : Engine - Honda gas fed engine 340 cm^3 air cooled. Power - 6.6KW @3600 rpm Drive Unit - Hydrostatic infinitely variable Dimensions - L x W x H (1450 x 750 x 1000) Weight - 250 kgs (551 lbs.)

19) <u>DUMPER TRUCK AUSA</u>

S. No.	Description
1	Supply an approve brand heavy duty Dumper Truck (Ausa) with 10 Ton Payload with a frontal and tilting unloading skip, a four by four (4X4) traction wheel drive with the maximum stability on rough terrain at full load with Kubota engine of great power and torque or equivalent.
2	Provide with a rear integrated counterweight for a better stability on rough terrain and protect against impact.
2	Provided with a water cooled diesel engine developing about 72.8 kw @ 2000 rpm.
3	Equipment should be a four (4) wheel drive system with variable forward & reverse speeds travelling 0-20 km/hr.
5	Install triple side enclosure with roll-over protection cab with safety lock-out system. Fitted with lifting rings on top of the cab.
6	Static Dimensions should be supplied as follows : Load Capacity – 10.000 kg Hopper capacity – 5.225 I / 5.944 I Traction – 4X4 Engine – 72.8 kW Unloading system – Front / revolving Measures (wide x long x high) – 2,44 x 4,52 x 3,75m / 2,44 x 4,99 x 3,75m Unladen weight – 4.760 kg / 4.990 kg
7	Supply of brand new wheel spanner and set of original equipment manufacturer OEM set of tools supplied with the unit.
8	Provide one (1) set body striping for the equipment , should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film.

9	Install two (2) amber rotating lights should be installed on the roof of the cabin with casing protection against breakage.
10	Provision for a suitable fire extinguisher A,B&C grade with complete tool box kit and UK approved first aid kit, located inside the drivers dashboard cabin compartment.
11	Install two (2) high intensity night working lights (halogen type) to be installed on the front side to assist operations during night time and for better visibility. .
12	Provide two (2) oval shaped side mirrors located in the front side bars of the equipment.
13	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.

(20) DOUBLE CABIN TRUCK

S. No.	Description
1	Supply of an approved brand double cabin truck, standard chassis 5-speed manual transmission or automatic gear with standard wheelbase. Mitsubishi canter or equivalent offer.
2	Provide an engine as specified, should be a 5Liter or above gasoline fed engine 4 cylinder 16V DOHC with Turbo.
3	Vehicle must have the minimum standard dimensions
4	Provision of a five (5) seating capacity fully air conditioned crew cabin with full features of a standard crew cabin.
5	The loading bed should be protected with a hard plastic bed liner to protect the body from scratches and dent.
6	Provide one (1) set body striping for the vehicle body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign on the tail gate.
7	Install brand new LED Type light bars, rigidly attached on the roof top of the cabin. This Specifications for the LED light bars : a. Street lazer 54" 1.37M 12 volts, 3amps. 80FPM b. Color, illuminates AMBER c. LED configuration :corner(4); front (4) & rear (7)
8	Provide suitable fire extinguisher A,B&C grade with complete tool box kit and UK

	approved first aid kit located in the secured compartment.

AUXILIARY POOLING EQUIPMENT
1) LOW BED TRAILER

S. No.	Description
1	Supply an approved brand heavy duty 6X6 Tractor Head with 410 HP / 306 Kw, Manual / automatic gearbox, 3600 mm Wheelbase and Steel Spring Suspension.
2	Must be a forward control, single cabin, left hand drive, seating 2+1 or extended cab or equivalent.
3	Engine should be Euro 3 or 5 compliant 240/280.
4	Provision of all in stock safety and driving comfort features as supplied by the original equipment manufacturer OEM.
5	Supply one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and backside of the cabin.
6	Provide LED Type light bars, attached on the roof top of the tractor head, while two(2) amber rotating lights should be installed at the rear side of the truck with casing protection against breakage. Specifications for the LED light bars : a. Street Lazer 54" 1.37M 12 volts, 3amps. 80FPM b. Color, illuminates amber c. LED configuration :corner(4);front (4)&rear (7).
7	Install two (2) high intensity working lights (round halogen type) should be installed under the truck bed to assist in night time operations.
8	Supply of brand new 8 axle Low Bed Trailer welded by submerged welding machine from 20 mm x 150 mm (ST 52.3 A Quality) bottom and top and 10 mm ST 52.3 hub plate. It has "I" section and also has 4 pieces, Rack is supported with 160 NPI axle beams that crosses rack.
9	Axle must be manufactured in accordance with the European standards. It has a carrying capacity of 60-95 tons with 10 to 45 meter length and donated Brake lining and bearing mark TIMKEN and FAG Axles have 10 wheel brace. Axle is certificated by ISO 9001 and 100.000 km guaranty.
10	8 axles used with the capacity of 12-14-16 tons, are used with self-steering, and hydraulic remote control, With Air suspension, Stowage spring, Bogie suspension and there are brake shoes and heavy brake levers suitable for TSE norms.

11	Suspension system must be Parabolic double deck Z springs, Stowage springs, bogie suspension.
12	Front axle lifting must be remote operated elevating system for front axle shaft in cabin.
13	Electrical System must be suitable for SAE standards and Tüv regulations, Electricity is provided by 7 pin plug from vehicle, There are necessary traffic advisory and stoplights on both sides, and there are backlights, brake lights, license plate lamps, trailer reflectors and orange warning lights on the sides.
14	Install Brake system with 71/320/ewg ff brake system according to EC standards and Automatic slacks, 2 spring brake chambers 2 service brake chambers, 4S/2M ABS, and Air leaks in trailer are blocked by Sweden patented Ruffels union system.
15	Provide Steel king-pin which is 2" according to DIN 74080 standards and 3½" 42 CRMO4 according to DIN 74083 standards are used.
16	Parking legs On the front: 24 tons mechanical trailer legs and On the behind: Manuel support legs
17	Install Loading ramp Back legs with Air-Hydraulic and with piston are manufactured from NPU with 160.
18	Must be diamond embossed plate and solid floor on tires and sides
19	Rack and superstructure are painted in paint drying oven by Washing + Sanding + 2+1 coat Acrylic Paint
20	Provide Standard Accessories; a. 2 x 9 expanding brackets (300+300 mm) b. 2 x 9 load binding ring c. 1 x tool closet(under suspension beam) d. 2 x Bike safety bar e. 1 x Tire weld and holder f. 1 x Plastic water with the capacity of 60 lt.
21	Install EBS Emergency Breakdown Service Double spare tire conveyor and Aluminum rims.
22	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.
23	Install two (2) high intensity working lights (round halogen type) should be installed under the truck bed to assist in night time operations.

24	Provide one(1) diagnostics Laptop AppleMac Book Pro basic for servicing and maintenance purposes. Operations and Maintenance CD's and manuals should be also provided.

2) CRANE 50 TONNE CAPACITY

S. No.	Description
1	Supply an approved brand heavy duty, 50tonne GVW Crane Truck, forward control driven by a diesel engine Cummins QSB6.7 6 cylinder developing not less than 173 HP at 2,200 rpm Maximum Gross Torque 590 ft-lb at 1,400 rpm, Intake: Turbo Charger with intercooler, . Engine should be Euro 3 or 5 compliant 240/280.
2	6X6 Power transmission with torque converter, Selectable 4WD (Four Wheel Drive), Rigid mounted front axle, Oscillating rear axle, rear oscillation lock – manual or automatic actuation, Air over hydraulic disc brake, front axle parking brake and hydraulic oil cooler.
3	Hydraulic power steering, Front wheel steering, Four wheel steering concentric and Four wheel steering crab.
4	**Hydraulic pumps:** Tandem Pumps: Boom lift / Telescopic, Power steering / Outriggers and swing, **Single Pump:** Main and auxiliary hoist pump, Hydraulic oil reservoir capacity, Hydraulic oil suction filter and Hydraulic oil return filter.
5	Must be a "Forward Control", single cabin, left hand drive, sliding door hinged, tinted all glass skylight, six way adjustable seat, hydraulic powered air conditioner and hydraulic power heater.
6	Must be armrest mounted dual axis electro-proportional-joysticks, steering wheel column with gear selection on the left and directional light selector on the right, Dashboard mounted switches for outrigger operation, Graphic interface for rated capacity indicator.
7	Should have all in stock safety and driving comfort features as supplied by the original equipment manufacturer OEM.
8	Provide one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and back drop side panel of the truck. (Please see WZTMG specification – For reference only).
9	Provide rotating beacon, attached on the roof top of the crane, while two(2) amber rotating lights should be installed at the rear side of the truck with casing protection against breakage, work lights also included.
10	Install hydraulic outriggers front and rear, driven from the engine by PTO with warning lights duplicated controls on both sides of the body.
11	Design a truck side guard protection should be in accordance to space available. This should prevent cars from crashing underneath the truck.
12	Installation of two (2) night working lights (round shaped halogen type) should be installed underneath the truck bed to assist in night time operations.
13	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.
14	Install four (4) side warning lamps yellow 2x4 inch dimension/size or equivalent alongside the side body of the truck to serve as warning to motorist on the

	roadway.
15	Provide one(1) diagnostics Laptop AppleMac Book Pro basic for servicing and maintenance purposes. Operations and Maintenance CD's and manuals should be also provided.

3) CRANE 100 TONNE CAPACITY

S. No.	Description
1	Supply an approve brand heavy duty, 100 tons GVW Crane Truck, Rear engine, left hand steering, driving axle 2-way Pivot selected type by manual switch, 4x2 front drive, 4x4 front and rear drive.
2	High tensile steel frame, all welded mono-box construction, Electronically controlled full automatic transmission. Torque converter driving full power shift with driving axle selector. 6 forward and 2 reverse speeds, constant mesh (3 speeds - high range - 2 wheel drive; 4 wheel drive, 3 speeds - low range - 4 wheel drive) Travel speed of 22 mph (36 km/h).
3	Front Axle: Full floating type, steering and driving axle with planetary reduction. Rear Axle: Full floating type, steering and driving axle with planetary reduction and non-spin rear differential.
4	Hydraulic power steering controlled by steering wheel. Four steering modes available: 2 wheel front, 2 wheel center rear, 4 wheel coordinated and 4 wheel crab.
5	Front Suspension: Rigid mounted to frame. Rear Suspension: Pivot selected mounted with hydraulic lockout device, Brake system must be Service: Air over hydraulic disc brakes on all 4 wheels. Parking/Emergency: Spring applied-air released brake acting on input shaft of front axle. Auxiliary: Electro-pneumatic operated exhaust brake, Tires be 29.5-25 34PR(OR).
6	Four hydraulic Outrigger , beam and jack outriggers. Vertical jack cylinders equipped with integral holding valve. Each outrigger beam and jack is controlled independently from cab. Beams extend to 23' 11-3/8" (7.3 m) center-line and retract to within 10' 10-1/2" (3.315 m) overall width with floats. Outrigger jack floats are attached thus eliminating the need of manually attaching and detaching them. Controls and sight bubble located in superstructure cab. Four outrigger extension lengths are in superstructure cab. Four outrigger extension lengths are provided with corresponding "RATED LIFTING CAPACITIES" for crane duty in confined areas. Min. Extension 8' 10-5/16"(2.7m) center to center Mid. Extension18' 1/2"(5.5m) center to center Mid. Extension21' 11-3/4"(6.7m) center to center Max. Extension23' 11-3/8"(7.3m) center to center Float size(Diameter)1' 11-5/8" (0.6m)
7	Should have all in stock safety and driving comfort features as supplied by the original equipment manufacturer OEM.
8	Provide one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and back drop side panel of the truck. (Please see WZTMG specification – For reference only).
	Provide rotating beacon, attached on the roof top of the crane, while two(2) amber

9	rotating lights should be installed at the rear side of the truck with casing protection against breakage, work lights also included.
10	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.
11	Install eight (8) side warning lamps yellow 2x4 inch dimension/size or equivalent alongside the side body of the truck to serve as warning to motorist on the roadway.
12	Boom must be five (5) section full power synchronized telescoping boom, 39.4'~154.2' (12.0m~47.0m), of round box construction with seven sheaves, 17-5/16" (0.44m) root diameter, at boom head. The synchronization system must consists of two telescope cylinders, an extension cable and retraction cable. Hydraulic cylinder fitted with holding valve. Two easily removable wire rope guards, rope dead end provided on both sides of boom head. Boom telescope sections are supported by wear pads both vertically and horizontally. Extension speed 114.8' in 160 seconds.
13	Boom elevation must be a double acting hydraulic cylinder with holding valve. Elevation -1.5o~80.5o, combination controls for hand isor foot operation. Boom angle indicator. Automatic speed reduction and soft stop function. Boom raising speed 20º to 60º in 46 sec.
14	JIB must be Two stage bi-fold lattice type with 3.5º, 25º or 45º offset (tilt type).Single sheave, 15-5/8"(0.396m) root diameter, at the head of both level jib sections. Stored alongside base boom section. Jib length is 33.2' (10.1m) or 58.1' (17.7m). Assistant cylinders for mounting and stowing, controlled at right side of superstructure. Self-stowing jib mounting pins.
15	Auxiliary Lifting Sheave must be (Single Top)Single sheave, 15-5/8"(0.396m) root diameter. Mounted to boom head for single line work (stowable).
16	Provide Anti-Two Block Pendant type over-winding cut out Switch audio-visual (Failure lamp/Buzzer) warning system.
17	Hydraulic axial piston motor through planetary swing speed reducer. Continuous 360º full circle swing on ball bearing turn access table at 1.5min-1{rpm}. Equipped with manually locked/released is swing brake. A 360o positive swing lock for pick and carry and travel window modes, manually engaged in cab. Twin swing system: Free swing or lock swing controlled by selector switch on front console.
18	Main Hoist must be Variable speed type with grooved drum driven by hydraulic axial piston motor through speed reducer. Power load lowering and raising. Equipped with automatic brake (neutral brake) and counterbalance valve. Controlled independently of auxiliary hoist. Equipped with cable follower and drum rotation indicator. Drum must be Grooved 14-1/4"(0.362m) root diameter x 23-5/8"(0.6m) wide. Wire rope: 820' of 3/4"diameter rope (250m of 19mm). Drum capacity: 997' (304m) 7 layers. Maximum single line pull: 1st layer 21,550 lbs (9,770kg). Maximum permissible line pull wire strength: 14,600 lbs (6,600kg).
	Auxiliary Hoist must be variable speed type with grooved drum driven by hydraulic axial piston motor through speed reducer. Power load lowering and raising.

19	Equipped with automatic brake (neutral brake) and counterbalance valve. Controlled independently of main hoist. Equipped with cable follower and drum rotation indicator. Drum must be Grooved 14-1/4"(0.362m) root diameter x 23-5/8"(0.6m)wide. Wire rope: 456' of 3/4"diameter rope (139m of 19mm).Drum capacity: 997' (304m) 7 layers. Maximum single line pull:1st layer 21,550 lbs (9,770kg). Maximum permissible line pullwire strength: 14,600 lbs (6,600kg).
20	Provide Wire Rope Non-rotating 3/4"(19mm) 7X35 class. Breaking Strength 72,800lbs(33,000kg)
21	Hook Blocks must be 100 ton (90.7 metric ton)-8sheaves with swivel hook and safety latch. 7.3 ton (6.6 metric ton) - Weighted hook with swivel and safety latch.
22	Pumps must be Two variable piston pumps for crane functions. tandem gear pump for steering, swing and optional equipment. Powered by carrier engine. Pump disconnect for crane is engaged/ disengaged by rotary switch from operator's cab.
23	Install Multiple Control Valves actuated by pilot pressure with integral pressure relief valves.
24	Provide reservoir 222 gallon (840 lit.) capacity. External sight level gauge.
25	Filtration must be BETA10=10 return filter, full flow with bypass protection, located inside of hydraulic reservoir. Accessible for easy replacement.
26	Provide Oil Cooler air cooled fan type.
27	Both crane and drive operations must be performed from one cab mounted on rotating superstructure.
28	Left side, 1 man type, steel construction with sliding door access table and safety glass windows opening at side. Door window is powered control. Windshield glass window and roof glass window modes are shatter-resistant. Tilt-telescoping steering wheel. Adjustable control lever stands for swing, boom hoist, boom telescoping, auxiliary hoist and main hoist. Control lever stands can change neutral positions and tilt for easy access to cab. 3 way adjustable operator's seat with high back, headrest and armrest. Engine throttle knob. Foot operated controls: boom elevating, boom telescoping, service brake and engine throttle. Hot water cab heater and air conditioning.
29	Dash-mounted engine start/stop, monitor lamps, cigarette lighter, drive selector switch, parking brake switch, steering mode select switch, power window switch, pump engaged/disengaged switch, swing brake switch, telescoping/auxiliary hoist select switch, outrigger controls, free swing / lock swing selector switch, eco mode switch, high speed hoist (main/aux) switch and ashtray.
30	Instruments Torque converter oil temperature, engine water by temperature, air pressure, fuel, speedometer, tachometer, hour meter and odometer / tripmeter. Hydraulic oil pressure is monitored and displayed on the AML-C display panel.
31	Provide one(1) diagnostics Laptop AppleMac Book Pro basic for servicing and maintenance purposes. Operations and Maintenance CD's and manuals should be also provided.

4) MINI BUS 26 SEATER COASTER

S. No.	Description
1	Supply an approved brand Minibus 26 Seater (Coaster), 4.2 Diesel engine, 5 speed manual / automatic transmission, 4164cc, 6 cylinder in – line, OHC, generating 135hp/4000 rpm, max torque at 29.0 kg – m/2000 rpm and 3405 kg GVW.
2	Required overall vehicle length 6990 mm, Width 2035 mm and Height 2600 mm or equivalent.
3	Provide a unit with at least twenty six (26) seating capacity fully air conditioned crew cabin with full features of a standard crew cabin.
4	Supply of safety equipment, air bags & seatbelt for driver & passengers, an automatic braking system ABS, High mount stop lamp and all standard safety features as provided by the vehicle manufacturer.
5	Must be Air Conditioned plus front and rear heater, power steering and Auto folding centre door with buzzer.
6	Provide one (1) set body striping for the vehicle body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign on front and rear tyre cover of the vehicle.
7	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.
8	Supply a heavy duty tools rack, preferably plastic material that can hold the following : a. Wheel meter, b. Portable signage, c. Flashlight, d. Raincoat, e. Traffic cones, f. Water container, g. Hard hat, h. Personal protective equipment i. 10kg A,B &C fire extinguisher. All consumables will be also supplied alongside with all the vehicles on as need basis. Properly secured and stacked inside the vehicle to avoid any tools /materials that will serve as projectile during sudden brake/stop.

5) TEMPORARY SITE PORTABLE CABIN / TOILET / UTILITIES AND CONSUMABLE

S. No.	Description
1	Supply an approved brand Temporary Site Portable Cabin with heavy duty wall channel and angle grid structure to give rigidity, Thick Marine-Ply / Fiber board / Duraboard for a durable base and Homogenous anti-scratch PVC carpet over Marine Ply / Duraboard.
2	Walls must be 2mm GI Sheet on the outside, Pre-laminated board with ISI mark on the inside and Cavity filled with special density thick insulation so as to avoid overheating of the cabin.
3	Roof with a Top comprises of 2mm thick steel sheets. Each sheet will have overlap on all sides and sheet will be fully welded using CO2 welding to prevent ingress of water, Bottom shall be pre-laminated board, Cavity filled with special density thick insulation to avoid overheating and Air-gap shall be created in between the sheet and the insulation for further reduction in thermal conductivity using special Roof Cooling System.
4	Provide powder coated window Aluminum Sliding Windows of standard size 4' x 3' with tinted glass, Curtains / venation blinds must be provided for all / selected windows, Weather shades over all windows and Aluminium safety grills for windows must be provided.
5	Doors must be double skinned pressed steel with insulation, Provided with Godrej cylindrical latch and door closer, Aluminum powder coated Aldrop also shall be supplied for additional safety, Weather shade shall be provided over the door and Internal partition doors shall be wooden sliding type.
9	Install legs 4/6/8 nos. legs as per cabin size, 6"/12"/18"/24" in height provided so as to hoist up the cabin and single step assemble provided.
10	Exterior Finishing must be Matt finish UV resistant paint on top of special grade anti rust and elastic primer from specially recommended for GI. Interior Finishing must be Wooden or off-white finish laminate.
11	All wiring and switches shall be ISI marked, Concealed wiring shall be provided, Main inlet plug adaptor for efficient and leak-proof flow of current, MCB, ELCB shall be provided for additional safety and Air-conditioning units must be provide.
12	Provide a suitable fire extinguisher A,B&C grade.

6) PORTABLE CONCRETE MIXER

S. No.	Description
1	Supply an approved brand Portable 2 cubic meter Concrete Mixer or equivalent with self rotating operated by a 13.5 HP Gasoline Motor Engine,1400 lb Axles that automatically turn the heavy duty drum while you drive.
2	Provided with hydraulic control panel that lift and rotate the barrel at job site, drum to turn automatically when your vehicle is moving.
3	Provide lightweight discharge chute for easy discharge while moving straight or moving in tight places and can be stored on either side or in the back.
4	Provide one (1) set body striping for the Mixer Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film
5	Provide a suitable fire extinguisher A,B&C grade and complete tool box kit (basic mechanical hand tools).

7) COLLISION INVESTIGATION VEHICLE

S. No.	Description
1	Supply an approved brand Sports Utility Vehicle SUV type 4.0 litre V6 gasoline engine (1GR-FE) 24 Valve DOHC with dual VVT-I electronic fuel injection 5-speed super intelligent ECT, sequential shift transmission, wheelbase about 2790 mm and GVW 2990kg.
2	Provide a 4.0 Litre gasoline fed engine V6 cylinder DOHC with Turbo. Electronic Fuel injection developing with a maximum torque of 38.9kg-m @4400 RPM
3	Required overall vehicle length 4780, Width 1885 and Height 1835 mm or equivalent.
4	Provide a unit with seven (7) seating capacity fully air conditioned crew cabin with full features of a standard crew cabin.
5	Supply of safety equipment, air bags for both driver & passenger, an automatic braking system ABS and all standard safety features as provided by the vehicle manufacturer.
6	Provide one (1) set body striping for the vehicle body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign on front and rear tyre cover of the vehicle.
7	Install LED Type light bars, attached rigidly on the roof of the car. Attached unit should be able to withstand speeds of 120kph without vibrations Specifications for the LED light bars : a. Street lazer 54" 1.37M 12 volts, 3amps. 80FPM b. Color, illuminates AMBER c. LED configuration :corner(4); front (4) & rear (7)
8	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.
9	Supply of Heavy duty Digital Camera with Built-in Global Positioning System (GPS) functions and pressure/altitude/depth gauge to facilitate outdoor shooting, Extra-large, high-resolution, wide-frame 3.0-inch LCD monitor, Full HD recording for extended shooting of high-quality videos, Six Macro Lights to assist close-up shooting, Dual anti-shake protection for sharp, blur-free images, High-performance, back-illuminated CMOS image sensor, A comprehensive selection of shooting modes, Exceptional image description, Heavy-duty construction for underwater shooting to 14 metres deep, and up to two continuous hours. RICOH WG-4 GPS or equivalent, accessories also must be included; a. Carabiner strap b. Waterproof remote control c. Sport strap

	d. Yellow floating strap e. Chest harness f. Neopreme case g. Battery charger kit h. Video cable i. Lens adapter, j. Wide conversation lens, k. Handle bar mount, l. Sunction cup mount m. Holder n. AC Adapter kit o. USB Cable p. Lithium-ion battery
10	Install excellent satellite navigation system with 6-inch touch screen display, interactive 3D mapping, Traffic Messaging Technology, Preloaded Maps, Navigation Instructions, Built in speaker, Maximum battery lifetime of 12 Hours, USB connection, Memory Card and Speed camera detector.
11	Install high quality digital surveillance with the ACPO approved police pilot speed measurement tool. Provida 2000 "Police Pilot or equivalent.
12	Supply a high quality, durable and reliable speed gun with high-impact waterproof casing, LTI's exclusive Accuracy Validation software, pinpoint targeting and accurate validation of precise speed. LTI 20/20 Ultralyte 100 LR hand held speed gun or equivalent including the following accessories; a. 20" LTI 4-pin (Straight) To LTI 4-pin (Right Angle) b. 36" (91 CM) LTI 4-pin To DB9 Download Cable, c. Remote Hard Wired Trigger d. Pelican Hard Case For UltraLyte e. Tall Laser Side Brackets – MSTA f. UltraLyte "L" Yoke w/o Mount g. UltraLyte 2x Converter h. UltraLyte Battery Eliminator i. UltraLyte Mounting Assembly j. UltraLyte Rechargeable Batteries – NiCad k. UltraLyte Rechargeable Battery 4 Bay Charger l. UltraLyte Rechargeable Battery Kit m. Ultralyte Series Extended Warranty n. UltraLyte User Manual and trainings o. UltraLyte Yoke & Mounting Assembly p. UltraLyte Yoke For TruAngle
13	Supply of 3D Terrestrial Laser Scanner that provides high speed , non-contact data acquisition using a narrow infrared laser beam and a fast scanning mechanism. Riegl VZ-400 or equivalent including all essential accessories.
14	Supply of simple, quick and reliable pocket type multi-function laser distance meter and digital incline measurement equipment. Leica pocket laser measurer or equivalent.
15	Install instrument for measuring vehicle performance, accuracy in calculating vehicle speed and distance from acceleration and time with powerful graphic software that allows the user to graph, overlay, table display and software data. Vericom Accelerometer 4000 or equivalent.
	Provide a high quality portable skid resistance testing equipment or equivalent CRT-Pendulum that ca n be used in Traffic accident investigations, Litigation

16	investigations, Testing of new road surface materials under development, Testing of aggregates in the PSV (Polished Stone Value) test, Assessment of surface friction and skid resistance properties, Testing of pedestrian walkways and Testing of pavers in the Flat Bed Polisher. Following accessories must be included; a. S886 Base Plate b. SPFEET Set of 3 Spreader Feet c. 885/1050 1.25" Rubber Mounted PSV Slider d. 885/1060 3.00" Rubber Mounted TRL (55) Slider e. 885/1070 3.00" Rubber Mounted Four S (96) f. 885/1431 3.00" Rubber Mounted CEN Slider g. CAL1 First traceable calibration h. 885/1024 Tool Kit i. 885/1200 Pendulum Instrument case j. Trainings and manual also must be included
17	Provide heavy duty, accurate, sensitive and durable hand held reflectometers equipment that measure all types of retroreflective sheetings for road signs. RetroSign GR3 Retroreflectometer or equivalent. Manuals and Training should also be included.
18	Supply a heavy duty tools rack, preferably plastic material that can hold the following : a. Measuring wheel, b. Pocket tape, c. 5m extendable measuring staff, d. 50m open frame tape e. Portable inclinometer / level f. Road Marking paint & crayon g. A3 Clip Board h. Traffic cones, i. Relevant portable signs j. Thermometer / probe k. Heavy duty brush l. Shovel m. Heavy duty black bags n. Torch o. Lantern p. Tool Box q. A Frame evidence markers r. Adhesive photo ruler s. Arabic crime scene tape t. Raincoat, u. Water container, v. Hard hat, w. Personal protective equipment x. 10kg A,B &C fire extinguisher. All consumables will be also supplied alongside with all the vehicles on as need basis. Properly secured and stacked inside the vehicle to avoid any tools /materials that will serve as projectile during sudden brake/stop.
19	Provide one(1) diagnostics Laptop AppleMac Book Pro basic for servicing and maintenance purposes of the listed equipment in this item. Operations and Maintenance CD's, manuals and training should be also provided.

8) BOWSER TRAILER WHICH CAN BE CONNECTED TO UTILITY VEHICLE

S. No.	Description
1	Supply an approved brand Bowser Trailer with 2000 litter water capacity, Poly water tank c/w baffle, 18" manhole & locking cover, mounted on highway tow twin axle chassis c/w pump plate, 14" wheels & tyres.
2	Must be Polyethylene tank, suitable for transporting water, can be mounted on a galvanised chassis with road tow, site tow or skid mount options.
3	Robust 6-8mm thick polyethylene, baffled tank and galvanised chassis eliminates rusting and ensures long life, Easily drained and cleaned by use of fast drain and access manhole.
4	Must be Internal moulded baffle and aerodynamic shape make for safe and easy towing and Front chassis extension allows pressure washers and pumps to be fitted.
5	Chassis must be approved for towing on public highway, Hot dip galvanised chassis for protection against corrosion, Internal baffles prevent water surge during towing and Adjustable jockey wheel and option of ball or eye coupling.
6	Install Highway lighting, 7 pin plug & mudguards (EU specifications), Lighting and number plate holder housed in protective channel.
7	Provide Rear support leg for greater stability when filling or when unit uncoupled, Ball and eye coupling.
8	Provide one (1) set body striping for the Mixer Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film
9	Provide a suitable fire extinguisher A,B&C grade and complete tool box kit (basic mechanical hand tools).

ENGINEER'S EMERGENCY RESPONSE EQUIPMENT

1) TRUCK MOUNTED ATTENUATOR US SERIES WITH COMPLETE ACCESSORIES

S. No.	Description
1	Supply of an approved brand new Truck Mounted Attenuator US Series with Complete Accessories, heavy duty 4x2 truck chassis 10T GVW coupled to a Crash Cushion TMA Scorpion or Verdegro. (Please also refer to TMA Checklist Items Attachment 1 of this Section C.)
2	Provide a "Forward Control", single cabin, left hand drive, seating 2+1 or with extended cab with rear bench seat fully air conditioned.
3	Engine should be Euro 3 or 5 compliant 240/280 in compliance with environmental standards in emission.
4	Provide all in stock safety and driving comfort features as supplied by the original equipment manufacturer OEM.
5	Provision of a four (4) point body harness (seatbelt system) to provide high level of drivers protection during collision with the TMA truck.
6	Provide one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and dropside panel of the carrier vehicle.
7	Install LED Type light bars, attached on the roof top of the tractor head, while two(2) amber rotating lights should be installed at the rear side of the truck with casing protection against breakage. Specifications for the LED light bars : a. Street Lazer 54" 1.37M 12 volts, 3amps. 80FPM b. Color, illuminates amber c. LED configuration: corner(4);front (4)&rear (7).
8	Provision of a secured steel tool box with locking mechanism for placement of working tools such as rake, shovel, cleaning brush and other road repair equipment. Dimensions should be equivalent to the width of the truck and 0.5M x 0.5M length
9	Construction of a steel fabricated truck bed all welded steel construction to specification ST 37-1 or equivalent. total length should not be less than 5.0 metres.

10	Flooring structure specifications should be 150x75x6mm channels and be used as runner with sufficient brackets100x50x3mm formed channel will be used as floor cross member and 100x50x4mm channels as floor rails. Floors will be finished with 4mm checker plate.
11	Provision of vehicle side guards will be provided as per standard, 80x40x2mm hollow tube. Connected with rigid hinges and heavy duty quality locks.(stainless or rigid steel). Vehicle side guard protection should be also designed according to space available.
12	Supply (2) high intensity working lights (round halogen type) should be installed underneath the truck bed to assist in night time operations.
13	Provision of one (1) heavy duty tow hook at the coupled to rear chassis for vehicle & equipment towing purposes
14	Install eight(8) side warning lamps yellow 2x4 inch dimension/size or equivalent alongside the side body of the truck to serve as warning .
15	Supply a 211 "Sign Arrow Board" on Yellow backing (1500 mm dia. arrow board on 2500 sq. yellow backing) Vertical Lift Type, motorized operation with the specifications as follows : a. Fully TSRGD, BS and EN approved and chapter 8 compliant for livery installation specs. b. 25x200mm amber lamps form a left/right arrow; synchronized with 610 arrow sign (diamond grade)on the bottom board & 2x340mm amber lamps fitted on the top board. c. Ultra bright arrows w- 2- LED or halogen lamps. d. High grade microprocessor electronics. e. Galvanized framework with grey aluminium or GI Sheet backing board for the light arrow. f. Easy to operate with cab fitted remote controls. g. Automatic day/night adaptation with manual override facility.
16	Provide four (4) lanterns across all corners. With all controls be operated inside the truck's cabin (operation should be fully automatic)
17	Supply and install two (2) cameras with monitor on the drivers dash board for easy view. One camera on the TMA and One camera on the rear portion of the truck.
18	Design of all controls should be in the drivers cabin, buttons to operate the attenuator, the arrow board. The auto air brake and camera monitors should be conveniently installed on the drivers dashboard.

19	Installation of an emergency braking system installed to activate the truck braking system, if a vehicle collides into the attenuator while the truck with trailer is moving
20	Supply a "Truck Mounted Attenuator US-Series –VERDEGRO Specifications" should conform with standards of NCHRP-350 TL-3 100KPH (pick-up truck as 2000P with a 2000kg test vehicle) vehicle). with risk analysis derived from EN 1050. (All specifications must be fully complied)
21	Supply the following test certifications : TL3-50 and 3-51 and the two optional test -52 and 3-53
22	Materials in honeycomb should be made by aluminium and galvanized steel parts as major components.
23	Provide the following test certifications TD49/07 110 kph UK Test, TRL and VTi approved with certifications.
24	Provision of dual hydraulic rams, double safety during transport and impact with dual safety valves used for lowering the ALU.
25	Design of controls should be installed inside the main cabin of the TMA truck for driver's use, while provision also for external operation should be provided for maintenance works.
26	Supply a suitable fire extinguisher, tool kit and first aid kit with flashlight situated in a secured compartment inside the truck cabin.
27	Provide two (2) amber rotating lights installed on the rear side of the truck with casing protection against breakage/damage.
28	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.

(2) POTHOLE PATCHING MACHINE 5 TONNES CAPACITY JETPATCHER

S. No.	Description
1	Supply an approved brand new Pothole Patching Machine 5 Tons Capacity, heavy Duty,4x2 truck chassis, not less than 19000 Tonnes GVW, wheel base of 4755mm water cooled diesel engine developing a net power of 280HP. Volvo /Jetpatcher combination or equivalent machine.
2	Should be a forward control, single cabin, left hand drive, seating 2+1 or extended cab if available. All in stock safety and driving comfort features as supplied by the original equipment manufacturer OEM.
3	Engine should be Euro 3 or 5 compliant 240/280 in compliance with environmental standards in emission.
4	Equipment should be in automatic transmission (ZF or Allison), with power assisted steering with air brakes.

5	Supply of full instrumentation to include water temperature, oil pressure, ammeter, fuel meter, speedometer, air pressure gage, and necessary safety controls warning light s for the truck and road repair machine.
6	Provide one(1) diagnostics Laptop AppleMac Book Pro basic for servicing and maintenance purposes. Operations and Maintenance CD's and manuals should be also provided.
7	Supply a suitable size of tyres and spare wheels with tyres, tubes, wheel spanner and 10T heavy duty jack. Tyre brands should be preferably recognized European brand.
8	Provision of a 24V electrical system with heavy duty battery and alternator, full lighting equipment and horns; reverse alarms and spotlights; night working lights on the side of the truck and spare sockets external use.
9	Installed frame, axles and springs, shock absorbers, wheels, tyres and equipment must be to correct specifications for the required GVW. Full details of all these items must be included in the tender together with the OEM printed specifications/ drawings.
10	Supply one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and backside of the truck.
11	Provide LED type light bars, attached on the roof top of the tractor head, while two(2) amber rotating lights should be installed at the rear side of the truck with casing protection against breakage. Specifications for the LED light bars : a. Street Lazer 54" 1.37M 12 volts, 3amps. 80FPM b. Color, illuminates amber c. LED configuration: corner(4);front (4)&rear (7)
12	Install a brand new LP13 directional arrow board (vehicle mounted with 13 Amber LED Lamps mounted on a four foot hazard warning on grey colored backing board – useful for hard shoulder or on single carriageway. Refer to LP 13 mini light arrow board specifications from (NISSEN).
13	Supply of brand new 5.0 cubic meter capacity rectangular shaped aggregate hopper to be mounted on the truck chassis by an accredited assembler of the road repairing machine.
14	Construction of the floor structure should be 150x75x6mm channels and be used as runner with sufficient brackets100x50x3mm formed channel will be used as floor cross member and 100x50x4mm channels as floor rails. Floors will be finished with 4mm checker plate.

15	Provide an aggregate hopper to be supplied with full length conveyor belt and full length carrier.
16	Supply of an edging screed which can place a thick layer of asphalt along a road edge or depression and will be supplied as an optional extra together with the spreader box mechanism.
17	Provision of an aggregate hopper opening must have a minimum of 3.4 x 2.1 M for safe and easy loading of materials.
18	Provide a dual air operated side gates, one to allow aggregate into the airstream from the aggregate hopper and the second to allow sand into the air steam from the sand hopper. Equipment with single gate will not be accepted.
19	Supply a hopper box for holding the aggregate and conveyor belt to gravity feed aggregate to a venturi air delivery system.
20	Provide air operated hinged gate that is opening and closing by a double stroke air ram. The ram will be controlled by a (12 or 24V) solenoid valve.
21	The machine should be suitable to use (3-10mm) aggregate specs. Multi aggregate size acceptance of the unit will be also accepted.
22	Supply of a heavy duty rotary positive displacement blower(compressor) to be used in conjunction with the machine. Direct drive off auxiliary engine – no belts and pulleys will be accepted. With a main driver engine : 52 HP water cooled diesel engine with safety controls and appropriate housing unit.
23	Design and supply of the engine compartment, fully insulated for noise suppression.
24	Provide full engine controls at the rear side of the unit, safety shutdown for high temp. low oil and blower overload, key stop
25	Hydraulic system design should be, hydraulic pump direct mounted. The hydraulic tank should be made of high grade steel, internal filter, strainer and with return line filter.
26	Install hydraulic controls at the rear of the hopper for conveyor and throttle control at nozzles.
27	Supply a heavy duty piston type compressor, with governor and regulator valve set at (4-5 BAR). airflow capacity @ 420LPM.
28	Provide a stainless steel water tank (100 -120 liters capacity) with pressure for cleaning and watering needs.

29	Supply a 60 litre kerosene tank, pressurized (4-5 BAR) for cleaning all emulsion lines. All required tank gage should be provided.
30	Install a pressurized emulsion tank (4-5 BAR) working pressure with 1600 litres capacity with all the gages and relief valve and one way cross over valve.
31	Supply 4.4metre in length aggregate hose with 88mm diameter hose made of steel lined neoprene rubber and non-kinking.
32	Provide an emulsion hose with working pressure of 3-4 BAR in line with the aggregate hose and the solvent or kerosene hose for cleaning the solvent line.
33	Provide a machine nozzle or hose that should be able to regulate the engine speed from the operator control module.
34	Install a fully articulated boom design, dual hinge type 310° rotation and supports all hose and control. Minimum of 3M working radius,
35	Provide an easy access ladder for maintenance works on the emulsion tank and the compressor area. Please refer to photo illustration as per BOQ #18.
36	Install two(2) working lights (round halogen type) should be installed under the truck bed to assist in night time operations.
37	Provision of one (1) heavy duty tow hook at the coupled to rear chassis for vehicle & equipment towing purposes.
38	Install eight (8) side warning lamps yellow 2x4 inch dimension/size or equivalent alongside the side body of the truck to serve as warning to motorist on the roadway.
39	Provide suitable fire extinguisher A,B&C grade 10kg with complete tool box kit and UK approved first aid kit. Must also include 2 pieces of body harness for maintenance use above the emulsion tank.
40	Provide two(2) amber rotating lights and should be installed on the rear side of the truck with casing protection against breakage/damage.

(3) POTHOLE PATCHING AND PAVEMENT PRESERVING MACHINE 5 TONNES CAPACITY ROAD REPAIRING MACHINE

S. No.	Description
1	Supply an approved brand new Pothole Patching Machine with 5 Tons Tack Asphalt and 158 Litter Oil Capacity, heavy duty, not less than 14, 800 lbs, wheel base of 290 cm water cooled diesel engine developing a net power of 173 BHP (129 kW) at rated speed of 2400 rpm. Python 5000 or equivalent machine.
2	Should be a forward control, single cabin, left hand drive, seating 2+1 or extended cab if available. All in stock safety and driving comfort features as supplied by the original equipment manufacturer OEM.
3	Engine should be Euro 3 or 5 compliant 240/280 in compliance with environmental standards in emission.
4	Equipment should be Hydrostatic drive system, capable of 55 mph (90 km/hr).
5	Supply of full instrumentation to include water temperature, oil pressure, ammeter, fuel meter, speedometer, air pressure gage, and necessary safety controls warning light s for the truck and road repair machine.
6	Provide one(1) diagnostics Laptop AppleMac Book Pro basic for servicing and maintenance purposes. Operations and Maintenance CD's and manuals should be also provided.
7	Supply a suitable size of tyres and spare wheels with tyres, tubes, wheel spanner and 10T heavy duty jack. Tyre brands should be preferably recognized European brand.
8	Provision of a 24V electrical system with heavy duty battery and alternator, full lighting equipment and horns; reverse alarms and spotlights; night working lights on the side of the truck and spare sockets external use.
9	Installed frame, axles and springs, shock absorbers, wheels, tyres and equipment must be to correct specifications for the required GVW. Full details of all these items must be included in the tender together with the OEM printed specifications/ drawings.
10	Supply one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and backside of the truck.

11	Provide LED type light bars, attached on the roof top of the tractor head, while two(2) amber rotating lights should be installed at the rear side of the truck with casing protection against breakage. Specifications for the LED light bars : a. Street Lazer 54" 1.37M 12 volts, 3amps. 80FPM b. Color, illuminates amber c. LED configuration: corner(4);front (4)&rear (7)
12	Install a brand new LP13 directional arrow board (vehicle mounted with 13 Amber LED Lamps mounted on a four foot hazard warning on grey colored backing board – useful for hard shoulder or on single carriageway. Refer to LP 13 mini light arrow board specifications from (NISSEN).
13	Supply of brand new 5.0 cubic meter capacity rectangular shaped aggregate hopper to be mounted on the truck chassis by an accredited assembler of the road repairing machine.
14	Construction of the floor structure should be 150x75x6mm channels and be used as runner with sufficient brackets100x50x3mm formed channel will be used as floor cross member and 100x50x4mm channels as floor rails. Floors will be finished with 4mm checker plate.
15	Provide an aggregate hopper to be supplied with full length conveyor belt and full length carrier.
16	Supply of an edging screed which can place a thick layer of asphalt along a road edge or depression and will be supplied as an optional extra together with the spreader box mechanism.
17	Provision of an aggregate hopper opening must have a minimum of 3.4 x 2.1 M for safe and easy loading of materials.
18	Provide a dual air operated side gates, one to allow aggregate into the airstream from the aggregate hopper and the second to allow sand into the air steam from the sand hopper. Equipment with single gate will not be accepted.
19	Supply a hopper box for holding the aggregate and conveyor belt to gravity feed aggregate to a venturi air delivery system.
20	Provide air operated hinged gate that is opening and closing by a double stroke air ram. The ram will be controlled by a (12 or 24V) solenoid valve.
21	The machine should be suitable to use (3-10mm) aggregate specs. Multi aggregate size acceptance of the unit will be also accepted.
22	Supply of a heavy duty rotary positive displacement blower(compressor) to be used in conjunction with the machine. Direct drive off auxiliary engine – no belts and pulleys will be accepted. With a main driver engine : 52 HP water cooled diesel engine with safety controls and appropriate housing unit.

23	Design and supply of the engine compartment, fully insulated for noise suppression.
24	Provide full engine controls at the rear side of the unit, safety shutdown for high temp. low oil and blower overload, key stop
25	Hydraulic system design should be, hydraulic pump direct mounted. The hydraulic tank should be made of high grade steel, internal filter, strainer and with return line filter.
26	Install hydraulic controls at the rear of the hopper for conveyor and throttle control at nozzles.
27	Supply a heavy duty piston type compressor, with governor and regulator valve set at (4-5 BAR). airflow capacity @ 420LPM.
28	Provide a stainless steel water tank (100 -120 liters capacity) with pressure for cleaning and watering needs.
29	Supply a 60 litre kerosene tank, pressurized (4-5 BAR) for cleaning all emulsion lines. All required tank gage should be provided.
30	Install a pressurized emulsion tank (4-5 BAR) working pressure with 1600 litres capacity with all the gages and relief valve and one way cross over valve.
31	Supply 4.4metre in length aggregate hose with 88mm diameter hose made of steel lined neoprene rubber and non-kinking.
32	Provide an emulsion hose with working pressure of 3-4 BAR in line with the aggregate hose and the solvent or kerosene hose for cleaning the solvent line.
33	Provide a machine nozzle or hose that should be able to regulate the engine speed from the operator control module.
34	Install a fully articulated boom design, dual hinge type 310° rotation and supports all hose and control. Minimum of 3M working radius,
35	Provide an easy access ladder for maintenance works on the emulsion tank and the compressor area. Please refer to photo illustration as per BOQ #18.
36	Install two(2) working lights (round halogen type) should be installed under the truck bed to assist in night time operations.
37	Provision of one (1) heavy duty tow hook at the coupled to rear chassis for vehicle & equipment towing purposes.

38	Install eight (8) side warning lamps yellow 2x4 inch dimension/size or equivalent alongside the side body of the truck to serve as warning to motorist on the roadway.
39	Provide suitable fire extinguisher A,B&C grade 10kg with complete tool box kit and UK approved first aid kit. Must also include 2 pieces of body harness for maintenance use above the emulsion tank.
40	Provide two(2) amber rotating lights and should be installed on the rear side of the truck with casing protection against breakage/damage.

4) STATIC HOTBOX 30 TONNE CAPACITY

S. No.	Description
1	Supply an approved brand new Static Hot Box 30 Ton Capacity, heavy duty "Static Hotbox" 36 Tonnes capacity inclusive of all accessories as prescribed by the Original Equipment Manufacturer OEM (Proteus or equivalent type/design)
2	, Fuel to run the equipment must be : kerosene or diesel fed burner's maintaining the asphalt at the necessary working temperature.
3	Provide a 200 litre diesel or kerosene tank alongside the unit, installation should be made in accordance with the approved safety standards. Design should be in conformance with approved mechanical design requirements of Qatar.
3	Provide a box capacity for a 36 tonnes and dimension should be designed to suit the requirement.
4	Should be operated directly from the box rear panel or by remote control to provide added safety unit features.
5	Provide doors that should be operated by air operated hydraulic rams connected to the unit built in compressor.
6	Installed control panel should be enclosed at the rear side of the box having all necessary operational control system and safety shutdown controls.
7	Unit should be easily transported from one location to another and all attachments should be plug in and plug out type of mechanism.
8	Provide two (2) sets per month of heavy duty heat resistant gloves that will be used for day to day operations.
	Supply two(2) sets of heavy duty rake, shovel and wheel borrow. These items will

9	be replenished upon observable wear and tear conditions occur for the entire contract term.
10	Construct a suitable base as permanent site or staging are of the Hot Box. Floor base should be constructed in accordance with Qatar Construction Specifications. Floor area will be based on a 1000 square meter working conditions.
11	Provide petrol and all other consumables needed to run the hotbox as needed. List of consumables should be supplied as per operating manual and the provisions associated with this contract.
12	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.

5) ASHPHALT RECYCLING MACHINE

S. No.	Description
1	Supply an approved brand new Portable Asphalt Batch Recycling Machine, trailer type VEB5000TM3040 capable of ; a. recycling asphalt millings and asphalt chunks at a rate of average 15 tonnes per hour; b. producing virgin hot mix asphalt from raw ingredients; c. producing asphalt in batches; d. braking chunks of asphalt lumps loaded into it's drum.
2	Equipment should deliver an average of 5 tonnes batch of hot mix within a 20-30 minute window. With a countdown timer that shuts of the burners just as the mix reaches the desired mix temperature of 165° (330°F).
3	The equipment is expected to operate in dessert terrains, urban and sub urban areas at high ambient temperatures (50°C - 60°C) salt laden environment and humidity range of 90 -100%.
4	Power Requirements Recycler should contain on board generating set should be not less than 65KVA 3 phase diesel engine generating set (Quiet Type) driving the helical gear box system and internal heat vector system. Should be equipped with the following : • Equipped with a 12V DC battery integral starting system, key activated; • Fuel tank size should be not lower than 250 litres; • A circuit breaker panel enclosed by a safety box; • All engine and generator components shall monitor stack temperature and housed in a walk in engine room adequate in size for maintenance work. • Lockable engine room door monitor and stack temperature;

	• All operator controls should be located at curbside towards the rear for safety and utilize electronic switched for operator convenience; • All control panel should be housed in a weather proof cabinet provided with locksets. • Equipped with a 12V DC battery integral starting system, key activated; • Fuel tank size should be not lower than 250 litres; • A circuit breaker panel enclosed by a safety box; • All engine and generator components shall monitor stack temperature and housed in a walk in engine room adequate
5	Material Feeder • Material hopper feeder shall include a hydraulic ram breaker capable of breaking large asphalt chunks upon loading and shall be mounted at the top of the discharge hopper. • Recycler should be fitted with a strobe light alarm activated by the recycler reaching it's full load capacity. • Material feed hopper must be capable of feeding millings and breakout material upto maximum size of 20"x20"x6".
6.	Unloading System • Recycler must be fitted with an unloading bin capable of retaining a minimum of half a ton ½ tonne of hot mix. • Unloading bin should contain a hydraulically activated exit door to allow intermittent stop/start of material discharge from the unloading bin. • Discharge bin door open/close shall be hydraulically operated. • Recycling capability shall be minimum of 5 tonnes per batch. • Recycler should be capable of dumping the entire 5 tonnes at one time.
7	Recycler Mixing System • Mixing system shall be capable of evenly and thoroughly mixing the liquid or pelletized additives in the recycler. • Mixing system shall be capable of producing a homogenous mix of the additives and recycled asphalt. • Recycler drum shall be capable of allowing a batch of hot mix to remain a desired temperature during the day and shall allow discharged of hot mix at will. • Drum flight shall be bolt on/off design for easy replacement. • Drum shall utilize a self-adjusting gear box. • Recycler shall incorporate an electric extraction fan.
8	Operator Station • The following controls should be included in the operators control panel : • Engine start/stop • Burner on/off/reset • Burner ready lamp • Burner Timer • Drum up/down • Material feed on/off • Exit bin door open/close • Exhaust Stack temperature • Emergency Stop

	• Burner Fuel Pressure Gauge • Burner Vacuum Pressure Gauge
9	<u>General</u> • Full instrumentation to include water temperature, oil pressure, ammeter, Fuel gauge, Speedometer, air pressure gauge, and necessary controls and warning indicators for operations. All instruments must be for the main and auxiliary engine. • Provide operating manual, workshop manual and spare parts catalogue (CD) for the equipment. • Frame axles, springs, shock absorber wheels tyres and equipment must be to correct specifications for the required GVW. Full details of all items must be included in the tender together with the manufacturer's printed shop drawings and options for recommendation to meet Ashghal requirements.
10	<u>Safety</u> • Emergency stop switches shall be positioned at multiple strategic locations. • Exhaust temperature policemen shall monitor stack temperature and provide an auto shutdown of the burner upon reaching a pre-set temperature. • Heating system shall include a safety locking box adjustable timer and allow to get a safety reset. • Timer shall provide automatic burner in safety locking box shutdown when time has expired. • Burner shall have an automatic flame out in safety locking box fault sensing, should a fault occur. The diesel flow shall be automatically interrupted. • Halogen fog lamps in front bumper or in a suitable location as designed by the truck body builder. • Emergency electrical switches for beacons and night working lights. • Audible reverse warning alarm. • Towing device at the rear end (Tow hook). • Storage lockers open warning lights or alarm for master switch for panel. • Indicator light with buzzer should be provided to indicate if any compartment door is opened or not properly closed.
11	<u>Paint and Finishing</u> • Rust proofing of the under chassis and sub structures with bitumen base coating or locally approved under coating materials. • The interior of all steel profiles shall be treated with anti corrosion Tectyl tar and provided with venting holes so as to prevent condensation.
12	<u>Warranty</u> • Recycler's manufacturer's warranty shall be a minimum of 2 years or more, • Engine manufacturer's warranty should be minimum of 2 years.

	• Burner manufacturer's warranty should be minimum of 2 years
13	Provide one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and backside of the truck. Backside being mounted on a frame attached to a suitable location.
14	Install eight (8) side warning lamps yellow 2x4 inch dimension/size or equivalent alongside the side body of the unit to serve as warning to motorist on the roadway while in tow.
15	Provide an easy access ladder for maintenance works on the emulsion tank and the compressor area. Please refer to photo illustration as per BOQ #22.
16	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.
17	Provide mechanical toolbox to be used for first level preventive and corrective maintenance, see following details below for complete requirement of tools and equipment:
	a. Stanley Plier Set (Mechanical, Cutter and Long Nose Plier) b. Stanley Combination Wrench Set c. Stanley Masonry Hammer d. Stanley Screw Driver Set e. Tyre Wrench f. Mechanical Jack g. Stanley Locking Plier Vise Grip h. 12 Volts Rechargeable LED Flashlight i. 12 Volts Rechargeable Torch light and Leatherman surge 21 Tools Herramientas
18	Provide Traffic Management devices that will be placed safely inside the truck cabin see the requirements detailed below:
	a. Traffic management PVC Cones of 1000mm height 25 pcs b. Men at work Signage 2 pcs c. Traffic Sign Left Signage 2 pcs d. Traffic Sign Right Signage 2 pcs e. 100mm Traffic Distance Signage 1 pc f. 200mm Traffic Distance Signage 1 pc g. Chevron Right 1 pc h. Chevron Left 1 pc

	i. Red White Colour Warning Tape as per consumption and j. Flashing Light with Solar Power 25 pcs Note : In accordance with the lasts version of Qatar – Work Zone Taffic Management Guide (WZTMG)
19	Provide Base Radio or Latest Smart Mobile phones 130 GB capacity with GPS or equivalent that will be installed at the vehicle and will be used for communication purposes

6) COMBINED IPV WITH BARRIER RIG TRUCK

S. No.	Description
1	Supply an approved brand new Combined IPV with Barrier Rig Truck Heavy Duty 4x2 chassis with a 7.5T Crane,50KVA Generating Set and a 9CFM compressor . Truck supplied should not be less than 16Tonne GVW. Using a six (6) cylinder diesel engine developing not less than 160 HP. Engine should be Euro 3 or 5 compliant 240/280.
2	Provide a forward control, crew cabin 1+2 persons , left hand drive, or with extended cab with rear bench seat and fully air conditioned.
3	Supply all in stock safety and driving comfort features as supplied by the original equipment manufacturer OEM.
4	Provide one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and backside of the truck. Livery design should be approved by Ashghal prior to any installation on the truck body.
5	Provide a 7.0M long galvanised traffic management body including cone wells. Safety handrails to cargo area and cone wells access points as describe in BOQ reference illustration #27. Rear side of the truck will house the compressor and generator followed by the crane mounting.
6	Provide a chassis to be fitted with a standard 15 metre working height platform hoist (chassis to be approved by hoist manufacturer with 3 mm canopy, contoured to protect the cabin.
7	Specifications of crane working height must be : Max working height – 22 m Max working cage floor height – 20 m Max working horizontal reach – 10 m
8	All controls should be located inside the cabin of the truck with all safety features as prescribed by the truck original equipment manufacturer OEM.
9	Provide four(4) independently operable hydraulic stabilizer with warning lights and integral safety check valves. Two(2) way boom / stabilizer interlocks to prevent operation of either out of sequence.

10	Supply and install a lowering boom articulates through 80^0 and install a 7.5T crane that should rotate 360^0 continuous slewing with all safety overload features.
11	Supply of this truck, crane, genset, compressor, lifts, lighting and warning devices should be all fabricated by an accredited assembler Swords Traffic Management or equivalent assembler to retrofit in all required machineries, tools and Traffic management equipment.
12	Supplied brand new 7.5T capacity crane should be certified by an accredited Third Party Assessor and should have all licenses and certificates for it's operator.
13	Construction of platform of GRP or other suitable material should be in compliance with the following : • Reinforced handrail with knuckle guard • Side access • Non slip floor (checkered 10mm plates) • Safety harness anchorages (2) • Movement control station with hooded protection • Insulation working – 2000V • Insulation test / 4 min. – 3000V With all approved safety signage and reminders as prescribed by international safety standards.
14	Hydraulic platform, preferably powered by auxiliary diesel engine with electric start, or PTO from main engine. Suitable for a 7.5T crane and rigging arms.
15	Dual controls from cage and base, with full shut down features for emergency needs.
16	Provision of four (4) airline host across the truck body for a 360° supply across the truck body, in quick release standard ½" airline system.
17	Full safety features including restrictor valve to control descent, automatic safety stops lock valve on boom cylinder, safety lock and motion control valves integral with all cylinders etc.
18	The barrier rig and truck should be provided with a minimum of 50 KVA generator silent type. This will be used to provide power to external appliances for maintenance works. Fuel line should be coupled to the main petrol source for the truck.
19	A 2 HP piston type compressor 9 cfm and must be housed by a noise absorbing covers. This will be used to power off auxiliary equipment such as pneumatic, torque wrench and other maintenance appliances.
20	All safety tools and equipment's that should come in with the vehicle are as follows :

	a. Disc Cutter – 12000 rpm, length 225mm, height 135mm b. Wire rope tension indicator c. Torque Wrench d. Metal cutting scissors 12" & 15" e. Manual Wrench Set f. Safety Gloves g. Adjustable Wrench h. Steel Rule i. Steel Tape j. Fibre Tape k. Spirit Label l. Cable Avoidance Tool CAT m. Thermometers (Mercury and Alcohol) n. Post Foundation Test Rig o. Rake and Shovel p. Insulated Spades q. Expanding Foam r. Spray Paint s. Cleaning equipment t. PPE, heavy leather/cotton gloves u. Googles with hard hat v. Ear muffs or Ear protectors w. High pressure electric powered portable washer. x. This requirement are classified as consumable items to be replenished once depleted or damaged.
21	A 211 Sign Arrow board on Yellow backing (1500 mm dia. arrow board on 2500 sq. yellow backing) Vertical Lift Type, motorized operation with the specifications as follows : a. Fully TSRGD, BS and EN approved and chapter 8 compliant. b. 25x200mm amber lamps form a left/right arrow; synchronized with 610 arrow sign (diamond grade)on the bottom board & 2x340mm amber lamps fitted on the top board. c. Ultra bright arrows with 2-fold LED lamps. d. High grade microprocessor electronics. e. Galvanized framework with grey aluminium or GI Sheet backing board for the light arrow. f. Easy to operate with cab fitted remote controls. g. Automatic day/night adaptation with manual override facility,
22	Install two(2) amber rotating lights and should be installed on the rear side of the truck with casing protection against breakage/damage.
23	Two(2) Night working lights should be installed strategically on the truck cabin or recommended location to assist in night time operations.
24	Vehicle side guard protection should be also designed according to space available. This should prevent cars from crashing underneath the truck

25	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.
26	Supply a steel tool box with compartments located under the truck bed for placement of maintenance tools such as compressor hose extension, electrical cable extension for the genset, hand tools such as wrench, socket wrench, bolt or fence cutters and other tools as prescribed in item#21.

7) TUNNEL WASHER MULAG

S. No.	Description
1	Supply an approved brand new Tunnel Washer Machine MULAG TWG 600-L 13,500 Litre Capacity, heavy Duty,4x2 truck chassis, not less than 19000 Tonnes GVW, wheel base of not less than 3900 mm water cooled diesel engine developing a net power of 260 HP Mercedes-Benz /Tunnel Washer TWG 600L 13,500 Litre water tank driven by 100kw pressure pump.
2	Should be a forward control, single cabin, left hand drive, seating 2+1 or extended cab if available. All in stock safety and driving comfort features as supplied by the original equipment manufacturer OEM.
3	Engine should be Euro 3 or 5 compliant 240/280 in compliance with environmental standards in emission.
4	Equipment should be in automatic transmission (ZF or Allison), with power assisted steering with air brakes.
5	Supply of full instrumentation to include water temperature, oil pressure, ammeter, fuel meter, speedometer, air pressure gage, and necessary safety controls warning light s for the truck and road repair machine.
6	Provide one(1) diagnostics Laptop AppleMac Book Pro 540 GB capacity for servicing and maintenance purposes. Operations and Maintenance CD's and manuals should be also provided.
7	Supply a suitable size of tyres and spare wheels with tyres, tubes, wheel spanner and 10T heavy duty jack. Tyre brands should be preferably recognized European brand.
8	Provision of a 24V electrical system with heavy duty battery and alternator, full lighting equipment and horns; reverse alarms and spotlights; night working lights on the side of the truck and spare sockets external use.

9	Installed frame, axles and springs, shock absorbers, wheels, tyres and equipment must be to correct specifications for the required GVW. Full details of all these items must be included in the tender together with the OEM printed specifications/ drawings.
10	Supply one (1) set body striping for the Truck Body, should be 3M SCOTCHLITE 980-72 RED micro-prismatic reflective film and 3M Scotchcal 3485 series Saturn Yellow non reflective film. A **"**HIGHWAY MAINTENANCE" sign in front and backside of the truck.
11	Provide LED type light bars, attached on the roof top of the tractor head, while two(2) amber rotating lights should be installed at the rear side of the truck with casing protection against breakage. Specifications for the LED light bars : a. Street Lazer 54" 1.37M 12 volts, 3amps. 80FPM b. Color, illuminates amber c. LED configuration: corner(4);front (4)&rear (7)
12	Install a brand new LP13 directional arrow board (vehicle mounted with 13 Amber LED Lamps mounted on a four foot hazard warning on grey colored backing board – useful for hard shoulder or on single carriageway. Refer to LP 13 mini light arrow board specifications from (NISSEN).
13	TWB Horizontal reach must be 6.5 meter from the centre of vehicle (Vertical 8.5 meter from the ground surface), must be right and left hand use as possible, hydraulic lateral shift of boom of 1800mm, swivelling range of 240°, Telescopic arm must be hydraulically adjustable to increase the reach by 1000 mm.
14	Supply of brand new Water Tank 13,500 Litter capacity including fitting parts, water pump must be driven hydraulically, rear installation on auxiliary frame including pick up claws for forklift to be mounted on the truck chassis by an accredited assembler of the tunnel washing machine.
15	Supply of brand new tunnel washing brush (Tunnel Washing Brush) or equivalent with spray protection and hoses; Diameter of brush 1000 mm, Working width: 2100 mm, swivelling range of 260°, can be switch on/off from operating panel, transport frame with leading pulleys and with automatic adaption to the tunnel wall via ultrasound sensor. All specs should be compatible to MULAG TWG 600-L
16	Provide safety stop: Electric switch on/off of cutter shaft on control panel including brake valve (stops in approximately 4 seconds), implement drive via front PTO-shaft, axial piston hydraulic system, oil tank with mineral oil, capacity 60 litres.
17	Must be proportionally control (CAN-Bus-Technology) of the boom including double cylinder operation (several functions can be operated simultaneously), one hand control panel with multifunction joystick (ergonomically perfectly adapted to the right hand, 4 functions on one level. All functions can be controlled proportionally) inside the cabin by driver.
18	Include Operator information system, system control and diagnostic mode, Flail arm relief control system AER Infinite contact pressure setting via potentiometer, can be switched on/off, working hour meter and mechanical torsion frame to prevent vehicle from distortion.

19	Provide an easy access ladder for maintenance works on the Tunnel Washer Water tank.
20	Install two(2) working lights (round halogen type) should be installed under the truck to assist in night time operations.
21	Provision of one (1) heavy duty tow hook at the coupled to rear chassis for vehicle & equipment towing purposes.
22	Install eight (8) side warning lamps yellow 2x4 inch dimension/size or equivalent alongside the side body of the truck to serve as warning to motorist on the roadway.
23	Provide a suitable fire extinguisher A,B&C grade with complete tool box kit (basic mechanical hand tools) with LED flashlight and UK approved first aid kit. Located in a secured compartment inside the drivers cabin.
24	Provide mechanical toolbox to be used for first level preventive and corrective maintenance, see following details below for complete requirement of tools and equipment:
	j. Stanley Plier Set (Mechanical, Cutter and Long Nose Plier) k. Stanley Combination Wrench Set l. Stanley Masonry Hammer m. Stanley Screw Driver Set n. Tyre Wrench o. Mechanical Jack p. Stanley Locking Plier Vise Grip q. 12 Volts Rechargeable LED Flashlight r. 12 Volts Rechargeable Torch light and s. Leatherman surge 21 Tools Herramientas
25	Provide Traffic Management devices that will be placed safely inside the truck cabin see the requirements detailed below:
	k. Traffic management PVC Cones of 1000mm height 25 pcs l. Men at work Signage 2 pcs m. Traffic Sign Left Signage 2 pcs n. Traffic Sign Right Signage 2 pcs o. 100mm Traffic Distance Signage 1 pc p. 200mm Traffic Distance Signage 1 pc q. Chevron Right 1 pc r. Chevron Left 1 pc s. Red White Colour Warning Tape as per consumption and t. Flashing Light with Solar Power 25 pcs Note : In accordance with the lasts version of Qatar – Work Zone Taffic Management Guide (WZTMG)

26	Provide Base Radio or Latest Smart Mobile phones 130 GB capacity with GPS or equivalent that will be installed at the vehicle and will be used for communication purposes.
27	Provide two(2) amber rotating lights and should be installed on the rear side of the truck with casing protection against breakage/damage.
28	Provide one(1) diagnostics Laptop Mac Book Pro 540 GB capacity for servicing and maintenance purposes. Operations and Maintenance CD's and manuals should also be provided.

8) PORTABLE VARIABLE MESSAGE SIGN GANTRY

S. No.	Description
1	Supply an approved brand new Portable Variable Message Sign Gantry type operated by a rechargeable battery solar powered charged by sunlight. Should be operating with minimal power consumption. LZA 500 Nissen or equivalent.
2	Provided with LED lamps, green, red & yellow with robust polycarbonate lens with contrast shield for superior visibility.
3	Provide the controller facing away from the traffic as safety design of the unit and a lighted display unit for night time use.
4	Supply a display light for night time use and a multi frequency technique for radio operation. Radio system will be based upon the agreed overall communications set up for all the operatives.
5	Provide a unit equipped with radar sensor for traffic density sensing and alarm system link to a remote controller. Supplied with an "imitator" with Bluetooth as link modem.
6	Must be suitable for two-way multi-purpose operations with pre-programmed selection table from the Portable Traffic Signal for the control of Vehicular Standards and basically should be user friendly.
7	Supply of a small pilot console battery operated for data transfer and programming in it's central control system.
8	Units supplied should have a fabricated protective housing or travel luggage type for safekeeping purposes and securing the LED lights.

9) PORTABLE GENY 80KVA MULTI PURPOSE WITH WELDING MACHINE

S. No.	Description
1	Supply an approved brand new 25 HP Portable Geny Twin Cylinder, Four Cycle Overhead Valve, Industrial air-cooled, gasoline (carburetor or Electronic Fuel Injection).
2	Rated output must be CC/DC Stick/TIG: 325 Amps at 28 Volts, 100% Duty Cycle, CV/DC MIG/FCAW: 325 Amps at 28 Volts, 100% Duty Cycle.
3	Welding Amperage Range must be CC/DC Stick/TIG: 10 - 325 Amps, CV/DC MIG/TIG: 10 - 35 Volts.
4	Generated power at Peak: 12,000 watts, 11,000 watts with LP Continuous: 10,500 watts, Excel Power: 120 V, 20 Amps, 60 Hz, 2400 watts pure generator power at idle speed and while welding.
5	Required overall dimension 20 inches wide, 28 inches high and 40.5 inches long or equivalent.
6	Include function such as Weld process switch, front panel fuel gauge, arc control, self-calibrating digital meter, standard 14-pin receptacle with auto remote sense, battery charge / jump start and provide pure generator at idle speed and while welding.
7	Supply of heavy duty Portable Geny accessories; a. Never flat tires, b. Multi terrain running gear, c. Hose and LP Tank Mounting Assembly, d. Off-road running gear, e. Protective cage with cable holders, f. 25-foot battery charge/jump cables with plug, g. Gas cylinder mounting assembly, h. Protective covers, i. Weld leads, j. Plasma cutting, k. Wireless remote hand control, l. Trailers and hitches
8	Provide one(1) diagnostics Laptop AppleMac Book Pro basic for servicing and maintenance purposes. Operations and Maintenance CD's and manuals should be also provided.

3.6. Illustration of Regular Pooling Equipment

Equipment Type	Model
1. CARGO CRANE WITH ROPE HOOK STOWING DEVICE OF 3.5 TON CAPACITY	*Source:* , for illustration purposes only
2. 6X4, 24 TON GVW TRUCK WITH 9 TON CRANE	*Source:* , for illustration purposes only
3. 18 TON TIPPER TRUCK W/ 10 TON PAYLOAD \CAPACITY	*Source:* , for illustration purposes only
4. 13 TON GVW HYDRAULIC PLATFORM HOIST W/15M REACH	

5. 13 TON GVW HAYDRAULIC PLATFORM HOIST W/ 22M REACH MANLIFT	*Source:* , for illustration purposes only
6. 16TON GVW HYDRAULIC PLATFORM HOIST WITH 34M REACH	*Source:* , for illustration purposes only
7. FORKLIFT – TELESCOPIC 15,000KGS CAPACITY.	*Source:* , for illustration purposes only
8. 0.6 CUBIC METER SKID STEER LOADER WITH BACKHOE	*Source:* , for illustration purposes only

9. JCB LOADER 1600IBS. CAPACITY WITH STANDARD ACCESSORIES	*Source:* , for illustration purposes only
10. WHEEL LOADER 5.0 CU METER BUCKET	*Source:* , for illustration purposes only
11. DOUBLE CABIN MULTI PURPOSE VEHICLE	*Source:* , for illustration purposes only
12. 10 TON SINGLE CABIN TRAFFIC MANAGEMENT VEHICLE	*Source:* , for illustration purposes only

13. 3,500 GALLON WATER TANKER W/HIGH PRESSURE PUMP	*Source:* , for illustration purposes only
14. ROAD SWEEPER VACUUM TYPE (TRUCK MOUNTED ROAD SWEEPER)	*Source:* , for illustration purposes only
15. INSPECTION VEHICLES – SUV	*Source:* , for illustration purposes only
16. RECOVERY VEHICLE	*Source:* , for illustration purposes only

17. PORTABLE TRAFFIC LIGHT	*Source:* , for illustration purposes only
18. ROAD MARKING EQUIPMENT*	*Source:* , for illustration purposes only
19. DUMPER TRUCK	*Source:* , for illustration purposes only
20. DOUBLE CABIN TRUCK	

3.7. Illustration of Auxiliary Pooling Equipment

1. LOW BED TRAILER	*Source:* , for illustration purposes only
2. CRANE 50 TON CAPACITY	*Source:* , for illustration purposes only
3. CRANE 100 TON CAPACITY	*Source:* , for illustration purposes only
4. MINIBUS 26 SEATER COASTER	*Source:* , for illustration purposes only

5. TEMPORARY SITE PORTABLE CABIN / TOILET / UTILITIES AND CONSUMABLES	*Source:* , for illustration purposes only
6. PORTABLE CONCRETE MIXER	*Source:* , for illustration purposes only
7. COLLISION INVESTIGATION VEHICLE	*Source:* , for illustration purposes only
8. UTILITY VEHICLE WITH BROWSER TRAILER	*Source:* , for illustration purposes only

3.8. Illustration of Engineer's Emergency Response Equipment

Equipment Type	Model
3.8.1 Truck Mounted Attenuator Supply approved brand 'Truck mounted attenuator with complete accessories', maintain during the contract period and handing over at the end of contract (Please refer to Clause 3.5 above for detailed equipment specifications) *Source:* , for illustration purposes only	
3.8.2 Pot hole patching machine Supply 'Pothole patching machine jet patcher 5 ton capacity with complete accessories', maintain during the contract period and handover at the end of contract (Please refer to Clause 3.5 above for detailed equipment specifications) *Source:* , for illustration purposes only	
3.8.3 Pavement preserving machine Supply 'Python pavement preserving machine 5 ton capacity with complete accessories', maintain during the contract period and handover at the end of contract (Please refer to Clause 3.5 above for detailed equipment specifications) *Source:* , for illustration purposes only	
3.8.4 Static hot box Supply an approve brand 'Static hot box of 30 ton capacity with complete accessories', maintain during the contract period and handover at the end of contract (Please refer to Clause 3.5 above for detailed equipment specifications) *Source:* , for illustration purposes only	

3.8.5 Asphalt recycling machine

Supply an approve brand mobile 'Asphalt recycling machine' with complete accessories', maintain during the contract period and handover at the end of contract
(Please refer to Clause 3.5 above for detailed equipment specifications)

Source: , for illustration purposes only

3.8.6 IPV truck with barrier rig

Supply an approve brand modern 'IPV truck with barrier rig' with complete accessories', maintain during the contract period and handover at the end of contract
(Please refer to Clause 3.5 above for detailed equipment specifications)

Source: , for illustration purposes only

3.8.7 Tunnel washer

Supply 'Tunnel washer', Mulag brand with complete accessories', maintain during the contract period and handover at the end of contract
(Please refer to Clause 3.5 above for detailed equipment specifications)

Source: , for illustration purposes only

3.8.8 VMS Signs gantry

Supply an approved brand 'Portable variable message signs gantry' with complete accessories', maintain during the contract period and handover at the end of contract
(Please refer to Clause 3.5 above for detailed equipment specifications)

Source: , for illustration purposes only	
3.8.9 Portable genset Supply an approved brand 'Portable geny 80 KVA with multi-purpose functionality, welding features' etc with complete accessories', maintain during the contract period and handover at the end of contract (Please refer to Clause 3.5 above for detailed equipment specifications) *Source:* , for illustration purposes only	